Gas Journal

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Editorial Notes

The Institution Meeting

As we go to press with this issue the first day's proceedings of the Annual Meeting of The Institution of Gas Engineers are concluded. By a stroke of misfortune, on the eve of the Meeting the President, Colonel W. M. Carr, was compelled to enter a nursing home to undergo an operation, and members of the Institution were deprived of the opportunity of greeting their President and of showing in some measure their appreciation of his leadership and untiring services. Not only members of the Institution, but all within and connected with the Gas Industry, will join with us in an expression of sympathy with Colonel Carr and the wish that he may speedily be restored to full health to enter once again into active service in an Industry which needs him so much. It is good to know, as was announced yesterday, that, when telegraphing his best wishes for the success of the Meeting, the President was able to announce that he was making good progress towards recovery of his usual good health.

In the circumstances the Presidential Address of Colonel Carr was read by Mr. Stephen Lacey, who will become Institution President at the close of the present Meeting. In the opening part of Colonel Carr's Address there occurs the simple statement that the past year has been a record one in the history of the Stretford Gas Undertaking, the sales of gas showing an increase of no less than 24%. Such an increase is not to be gained lightly in these days of fierce competition. It demands the application of modern methods of management, salesmanship, and service; it demands broadminded, courageous policy, the taking of legitimate risks to secure new business. In this respect the policy at Stretford provides an admirable example. Colonel Carr emphasizes that the financial risk involved in adhering to flat rate methods of charge is greater than that involved in the introduction of attractive tariffs, and that the rapid development of industrial sales at Stretford dates, in the main, from the introduction of the two-part industrial tariffs eight years ago. An optional two-part tariff for all domestic consumers was introduced in 1934 and is being rapidly taken up. At the end of last March 20% of the total number of domestic consumers had adopted the tariff, and it is interesting that, of these, prepayment users outnumbered ordinary consumers. Colonel Carr makes it clear, however, that the introduction of a tariff will not in itself produce additional business unless it is backed up by the best possible sales and service organization. This is equally true of both domestic and industrial supplies.

The successful manager of a gas undertaking to-day has to spend at least 80% of his time in the administration of his undertaking, more particularly that devoted to business development; and Colonel Carr gives his views on how capable administrators are to be obtained. In his opinion the technician is well equipped for management, but it does not follow that the ability of a gas engineer as such renders him suitable for commercial administration. On the other hand, the tendency of the Industry, he thinks, will be to continue to find its administrators from the ranks of technicians with the broadest theoretical and practical training who are well versed in business administration. Colonel Carr refers to the importance of the technical gas salesman, and urges the Institution to spare no effort to encourage the advancement of the gas engineer in this direction, in the belief that the profit on the modern gas undertaking is made in its service and sales organization.

What the aims of a holding company should be are outlined by Colonel Carr. It should provide for its subsidiaries the best commercial and technical brains to assist in the development of sales; it should help in the introduction of promotional tariffs, by the co-ordination of accountancy, by the provision of propaganda service and cheap finance for hire purchase, and so on. He also points to the advantage of being able to link up adjacent undertakings, which to-day is frequently prevented by reason of purely parochial interests. He believes that, in regard to central purchasing, a holding company should charge all materials and appliances to its subsidiaries at net cost, and for the purpose of financing its central administration make a charge upon its constituent companies based upon their output of gas. Thus, when the accounts of a subsidiary company are the subject of review, the cost of the central administration can be seen in its relationship to services rendered. Moreover, it is desirable that a holding company should maintain the initiative and the interest of the manager of the subsidiary, who must at all times be held responsible for his own undertaking; he, on his part, should not lose sight of the necessity for the " team spirit."

As was to be expected, Colonel Carr discusses the coal situation, which is the source of so much anxiety to the Gas Industry at the moment—so important is its bearing on the progress of our Industry that an emergency meeting of the British Gas Federation was called, and was held last night at the Central Hall. Our readers have been kept fully informed of the implications of the measures the Government propose. And among other matters touched upon by Colonel Carr are the need for increased expenditure on research and practical investigations in

connection with the many problems at present before us, for greater support of the educational facilities offered by the University of Leeds, and for closer liaison not only with such bodies as the Association of Public Lighting Engineers, the Illuminating Engineering Society, the Institute of Fuel, and the Institution of Chemical Engineers, but with the Institutions of Civil and Mechanical Engineers, with whom increased interchange of communications is most desirable.

Helping the Salesman

On more than one occasion we have put in a plea that the Gas Industry should enlist, to a much larger extent than it does at present, the co-operation of its great army of stockholders. If gas company proprietors were in the first place properly instructed on the subject and brought to realize the fact that they can by their own efforts serve their own interests, a very important step forward would be achieved at a very low cost. We have appealed to shareholders to use all their influence in their own and their friends' homes and businesses to see that they are well furnished with gas. Every shareholder can do his or her bit towards the prosperity of the undertaking in co-operation with the whole-time officials. Their own interests demand it, and in some way or other it must be impressed upon them exactly what services they, as proprietors of a gas undertaking, can offer to the public. This matter is referred to by Mr. H. Matterface in his Presidential Address to the Wales and Monmouthshire Association of Gas Engineers and Managers, and he shares the opinion we have previously expressed in these columns that chairmen at the annual meetings of companies should point out to shareholders the necessity of all doing their part in pushing gas.

The Monmouth Undertaking, which Mr. Matterface controls, is small, but consumers in the area of supply enjoy the service facilities afforded by the larger undertaking. There is, for example, a scheme of "free" maintenance; any appliance can be had on simple hire, though the hire-purchase terms are such as prove most attractive; and a showroom has been opened in the town. All this, says Mr. Matterface, is very expensive to a small undertaking, "but we must do it to be able to give our customers satisfaction." This, of course, is perfectly true, but not every small undertaking faces the matter squarely and organizes to ensure that the gas sold is utilized to the best advantage. Nor does every undertaking—small or large—concentrate as much as is the case at Monmouth on the lighting load, which represents over 25% of the total output and in recent years has increased. It cannot be too strongly emphasized that any loss of gas lighting goes much deeper than the mere loss of revenue entailed; it paves the way to the most intense form of electrical competition in other fields.

Training the Domestic Worker

Much comment has been made in recent years upon the seeming reluctance of the rising generation of girls to enter domestic service. There is, apparently, a tendency for those "enjoying" the "advantages" of office positions to look down upon their sisters in domestic service. Such a state of affairs is the more strange when it is borne in mind that domestic help was comparatively easy to obtain a few decades ago when the work involved much more nearly approached "hard labour" than at the present time, when the advent of up-to-date labour-saving appliances and modern ideas on employment renders housework incomparably less arduous than in the past.

The Gas Industry has in recent years done much to assist the housewife and help her to take an interest in her domestic activities—a recent step being, of course, the inauguration of the Women's Gas Council. The latest scheme of the Electrical Association for Women, however, goes further than the housewife. It aims to put domestic service itself on a higher plane; and in doing so it bids fair, incidentally, to make the proposed new class of "graduated" servants—"domestic workers," as we are invited to call them—definitely electrically minded. As was stated at the meeting at which the scheme was first mooted, here is great scope to raise the status of domestic work and to make it worth while for girls to enter. With the aid of electricity and labour-saving appliances, it was stated, house work is now cleaner, more dignified, and requires rather more intelligence and less physical effort. In order, however, that these new tools in the home may be used properly, it is felt that definite instructions should be given; and, in proposing the resolution, the Executive had also thought out a plan for arranging classes, while a certificate would be awarded, after a simple practical test, to those who were successful, and would be called "The E.A.W. Certificate for Home Workers."

Difficult as it is to-day to foresee the effect of such a scheme, it is not, perhaps, entirely beyond the bounds of possibility to visualize some future advertisement for a cook-general (or, for that matter, for a wife through the medium of the matrimonial press) concluding with "Only certificated domestic workers need apply." The idea, nevertheless, seems an excellent one; and it is up to the Gas Industry to decide by its own future action whether our "domestic workers" of to-morrow consist solely of girls who are only capable of operating successfully electrical appliances and who are predominantly pro-electric. While not a great deal of schooling is, generally speaking, required in order to understand the modern gas appliance, gas classes for would-be domestic servants on the lines of those suggested by the E.A.W. would undoubtedly serve a very useful purpose, and redound to the advantage of the Industry in bringing into being a body of girls who would not only be capable managers of gas apparatus in the sphere of domestic service, but also thoroughly gas-minded when the time comes for them to take over the responsibilities of home management themselves.

On General Service

It is the proud boast of the Gas Industry that its product is pre-eminently suited to every type and size of purse, that its services can be enjoyed by rich and poor alike—as witness the fact that there are nearly six and a half million prepayment consumers at present supplied by our Industry. Particularly of recent years great improvements have been effected in gas consuming appliances—improvements not only in thermal efficiency and convenience in use, but also in appearance. For these improvements we undoubtedly owe a debt of gratitude to the appliance manufacturers. Improved efficiency and lower running cost have necessarily had their reflection in decreased gas consumption for equivalent service; but the various loads of the Industry have been consolidated in a time of extremely severe competition.

To those with eyes to see, the beautiful appearance of modern gas cookers in their gaily coloured enamels is added to the cleanliness in use and the great convenience afforded by thermostatic control of oven heat. The appeal of appearance, alas, is denied the blind, but even the blind can now enjoy the convenience and certainty of a thermostatically controlled oven. Enquiries made by Radiation Ltd. a considerable time ago established that a large number of blind persons use gas cookers. As a result they decided to produce a special "Regulo" with

the numbers in Braille characters. In co-operation with various Institutions for the Blind, a design was finally approved, and we understand that cookers fitted with this Braille " Regulo " can now be supplied. This is just one more piece of evidence of our Industry's —and by " Industry " we mean the manufacturers of appliances and plant as well as the makers and suppliers of gas—untiring search for new ways to serve every section of the public.

Importance of Thrift

In the front rank of habits which need to be inculcated during the impressionable period of youth is that of thrift. That leaning towards saving which comes easily then is increasingly difficult to cultivate as the years roll by, even though its absence may be the subject of unceasing regret. The greater the demand upon one's purse, the greater would the necessity seem to be for saving, though some demands may hardly have the effect of stimulating such a desire. In this unfortunate category, perhaps, could be placed a rising level of Imperial taxation and of local assessments. But whatever may be the character of discouraging factors in the situation, strenuous efforts to make habits of thrift an essential part of the life of the citizen must be persevered in. The Gas Industry has already done much in this way; it must seek occasion to do still more.

Never were the facilities for " making a beginning "—that most important step of all—in the direction of saving so abundant as is the case to-day, and statistics reveal the enormous extent to which advantage is taken of them Much, indeed, is accomplished during school days; it is up to employers to do all they can to prevent any subsequent back-sliding. Speaking recently at the annual meeting of the City of London Savings Committee, the Financial Secretary to the Treasury (Mr. W. S. Morrison, K.C.) referred to the important influence of thrift in developing and building up the character of the citizen, and there was much wisdom in his simile that " savings are the seed corn of industry—that portion of the annual harvest which must be preserved, if other harvests are to arise." Mr. Morrison is fully appreciative of the good work that is done in schools; his anxiety is as to the steps that are taken afterwards.

In this respect, also, there is good ground for satisfaction. So much was revealed at the meeting, in reply to Mr. Morrison, by Lord Mottistone, Chairman of the National Savings Committee, who explained that negotiations for furthering the savings movement after school age have been successfully concluded. An Industrial Advisory Council has been formed, on which the interests of both employers and employees will be represented. In appealing for whole-hearted support of the movement by the Gas Industry, we would point out that a published list of influential men who have already agreed to serve upon the Council includes the name of Sir David Milne-Watson.

Personal

On Friday last we were informed by the Secretary of The Institution of Gas Engineers that Col. W. Moncrieff Carr, President of the Institution, had entered a nursing home on that day for an operation and would be unable to preside at the 73rd Annual General Meeting of the Institution. His place, we were informed, would be taken by the Senior Vice-President, Mr. Stephen Lacey. By the President's wish the programme of the Meeting was not otherwise altered.

Colonel Carr was operated on last Saturday morning, and we are very glad to be able to announce that his progress is satisfactory.

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We learn that Mr. L. B. Chapman, Deputy Gas Engineer to the Nelson Corporation, has been appointed Engineer and Manager of the Skipton Urban Council Gas Department in succession to Mr. N. B. Thompson, who is to take up the position of Engineer and Manager of the Ormskirk and District Gas Company. Mr. Chapman received his technical training at Rutherford College, Newcastle, and also served an apprenticeship in general engineering with the Birtley Iron Company, now the Birtley Company. He holds the B.Sc. engineering degree of London University. He has served with the Newcastle-upon-Tyne and Gateshead Gas Company as an assistant on the Engineer's staff, and was promoted to the position of Works Technical Assistant at the Company's Elswick Station. Before going to Nelson in 1931, he was Assistant Engineer and Manager to the Tipton Council Gas Department. Thirty-two years of age, Mr. Chapman is an Associate Member of The Institution of Gas Engineers and an Associate Member of the Institution of Mechanical Engineers.

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Mr. E. A. Corrall has recently celebrated his Golden Jubilee as South Midland representative for Messrs. Gittings & Hills, Ltd.

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On Thursday, May 21, a presentation of a Silver Celtic Cup was made to Mr. and Mrs. Philip Sugg by the Directors and Staff of Messrs. William Sugg & Co., Ltd., to commemorate their Silver Wedding on April 26 last, as a token of esteem and good wishes.

Obituary

It is with regret that we announce the death on May 15 of Mr. John Anderson, who retired from Messrs. Alder & Mackay, Ltd., in June, last year, after 43 years' service. Mr. Anderson was a familiar figure at meetings of the North British and Waverley Associations of Gas Managers and was very well known in the Industry generally. He was the Firm's technical expert and produced many ingenious patents, his most important contributions to the Industry being his change wheel prepayment meter, in which the slot mechanism was for the first time brought entirely outside the sealed top of the meter and which was first produced in 1899, and the pressure wave controller which was widely in use when war broke out, enabling cities where it was installed to enjoy special lighting privileges since they were able to throw their streets into complete darkness at a moment's notice. Mr. Anderson, who was in his seventy-fifth year, leaves a widow, a son, and a daughter.

The Institution of Gas Engineers

Attendances at Principal Functions

At the time of going to press we are informed by the Secretary of The Institution of Gas Engineers, Mr. J. R. W. Alexander, that the attendances expected at the various events during the Annual Meeting, according to tickets issued up to and including Friday, May 22, are as follows:

Total number attending Meeting	1,362
TUESDAY, MAY 26.	
President's Luncheon (Savoy Hotel)	195
WEDNESDAY, MAY 27.	
Cadby Hall	136
Greenford	218
Reception and Dance (Grosvenor House)	1,005
THURSDAY, MAY 28.	
Corby—	
Special Train (St. Pancras to Corby and back)	222
Luncheon (Special Train)	222
Tea (Corby)	227
Dinner (Special Train)	219
Neasden	155
Tower of London	72
FRIDAY, MAY 29.	
Portsmouth and Isle of Wight Visit—	
Special Train (Waterloo to Portsmouth and back)	219
Coach (P. & S. Station—Dockyard or Hilsea—Gas Offices—Pier)	219
Luncheon (Guildhall, Portsmouth)	267
Steamer (Portsmouth to Ryde and back)	227
Coach (Ryde—Sandown—Shanklin—Ryde)	227
Tea (Eastern Pavilion, Ryde)	235
Supper (Special Train)	194

News in Brief

Applications are Invited for the position of Assistant Gas Engineer to the Borough of Nelson Gas Department. The salary is £350 per annum rising to £380.

Applications are Invited by the Caledonian Gas Corporation, Ltd., for the position of Gas Sales Manager with general all-round experience in best methods of securing gas sales.

An Increase of 2·737% in the sales of gas for the year ended March 31, 1936, is reported by Mr. G. V. Heeley, Engineer and Manager of the Sittingbourne and Milton Gas Department.

The Hon. Secretary of the Eastern Counties Gas Managers' Association, Mr. W. C. Chapman, informs us that the new title of the Association, unanimously decided upon at the half-yearly meeting at Lincoln on May 7, is the Eastern Counties Gas Engineers' and Managers' Association, by which it will henceforth be known.

A Plebiscite is being taken by Jarrow Corporation among the tenants of 850 houses on their housing estates as to whether they are in favour of gas or electricity. If the vote results in favour of electricity the houses will be wired for lighting and the gas will be left for cooking purposes. The rents will be increased by twopence per week.

Mr. J. A. Rooney, Engineer, Manager, and Secretary of the Drogheda Corporation Gas Department, has been appointed to represent the direct coal importers of the Free State at the coming enquiry in Dublin which is to examine the price to be paid for coal, the quality of the coal, and the supplies of coal imported into the Free State from the United Kingdom collieries. The direct coal importers include gas undertakings, the Free State Electric Supply Board, and the railways.

Gas Consumption is Still Increasing at Aberdeen, and the laying of mains in the new roads at Rubislaw, Tanfield, and Scotstown to meet the needs of housing schemes there was authorized at a meeting of the Gas Committee of the Aberdeen Town Council. The monthly statement for the Department showed that during April the quantity of gas made was over 6 million cu.ft. more than a year ago. Revenue from coke sold increased by £695 and from tar products and ammoniacal liquor by £145.

At the Launch of the Collier "Icemaid" (2,920 tons) from Messrs. S. P. Austin & Sons' yard, Sunderland, for the Gas Light and Coke Company, Lord Hyndley, Director of Messrs. Stephenson, Clarke, and Associated Companies, Ltd., said that the Gas Industry was using more and more coal. He believed that if the present rate were maintained the Gas Light and Coke Company would consume 3,500,000 tons during the next 12 months. It was interesting to note also that they were using more Northumberland coal than ever before.

Proposals for Reducing Gas Charges are set forth by Mr. A. E. Ruffhead, Engineer and Manager to the Darlington Corporation in a report to the Gas Committee. This involves the introduction of a series of block rates which, if adopted, will be applicable only to domestic users and will take effect from the start of the current quarter, April 1. Mr. Ruffhead also suggests reductions in charges to six villages supplied by the Corporation, and estimates that the total concessions to consumers will amount to £5,400 a year.

Cookery Demonstrations held by the Barnstaple Gas Company in the Forester's Hall, which concluded on May 15, created great interest among Barnstaple residents and were particularly successful. Miss M. Taylor, M.C.A., of the Radiation Research Kitchen, demonstrated on the "New World" cooker how complete dinners could be cooked in the oven without attention, and many other interesting items were included in her menu for the week. The advantage of automatic oven-heat control was much appreciated by the audience.

A Successful Rating Appeal is reported from Northern Ireland, where the Bangor Borough Council have won their appeal against the valuation of £1.895 placed upon the Gas-Works in the general re-valuation of Ulster. While the appeal was successful the reduced valuation has not yet been fixed. The Recorder's decision to reduce the valuation was based principally on the ground that the Commissioners should have taken 17½% of the tenants' capital instead of 15% as had been done. He allowed the appellants' costs and ordered that they should be informed of the reduced valuation when the figures are agreed upon between the parties.

New Showrooms were opened on May 19 by the Carnoustie Gas Department. A shop at 112, High Street, which is the property of the Council, had been converted for this purpose. Prior to the public being admitted the premises were inspected by the members of the Town Council, who were entertained by Bailie Peter Crerar, Gas Convener. The premises are very attractively laid out, and in addition to gas fires, water heaters, and cookers, there are portable and panel radiators, wash boilers, and washing machines on show as well as ornamental gas lamps and globes.

Medical Officers of Health to the number of 120 visited the Beckton Works of the Gas Light and Coke Company on Friday, May 22. The party sailed from Westminster Bridge on the M.V. "Dagenham," famous river trip vessel. Beckton, the largest gas-works in the world, covers an area of 540 acres, including 70 miles of railway line. The visitors were shown the different processes of gas manufacture from the moment the coal arrives by the Company's fleet of ships from the North-East Coast ports. They also saw the £1,000,000 coke plant opened by King Edward when Prince of Wales.

A Lecture on Refrigeration was given on Tuesday, May 12, by Mr. Cox, of Electrolux, Ltd., at the Kidderminster showrooms to about 50 members of the Office and Distribution Staffs of the Kidderminster, Stourport, and Bewdley Gas Companies on the sale and maintenance of Electrolux refrigerators. Mr. Cox enlarged on the modern necessity of refrigeration since the introduction of the 1931 Food Act forbidding preservatives. Therefore, the only safe method of preserving food was by using a modern refrigerator cabinet. He then went on to describe the Electrolux gas-operated model.

The Annual Exhibition arranged by the Penrith Gas Department which was opened on May 11 continued until May 22. Demonstrations of cooking and washing were given daily, and this year the exhibition proved to be the most successful ever held. In declaring the exhibition open, the Chairman of the Council, Mr. Banks Swinburn, paid tribute to the new Engineer and Manager, Mr. G. Hudson, and his staff. Miss Z. Fitzgerald, of the Radiation Research Kitchen, was responsible for the cookery demonstrations, while Miss Bygate, of Messrs. W. H. Dean & Sons, gave the washing demonstrations.

The Opening of a highly successful exhibition of gas cooking and heating appliances in Cookstown was recently performed by Mr. J. D. Smith, Engineer, Manager, and Secretary of the Belfast Gas Department. At a dinner given subsequently by the Directors of the Cookstown Gas and Light Company, Mr. F. G. McElwee, Engineer and Manager of the Coleraine Gas Department, said in that town the demand was so heavy that the Coleraine Council had on hand a scheme for the improvement of the distribution. Other speakers congratulated the Cookstown Company on their initiative in arranging such a splendid display.

Since Installing a Benzole Plant the Plymouth Corporation Gas Department has produced 488,596 gallons of benzole for the City's Transport Department. It was pointed out in a report presented on Thursday, May 21, to the Gas Committee by the City Treasurer and the Gas Engineer, Mr. F. Blackburn, that this production was equivalent to 163 million cu.ft. of gas, or more than the total gas consumption in H.M. Dockyard at Devonport during that period. The net profit of the Undertaking during the past year was reported at £2,548, compared with an estimated profit of £442. During the past three years the price of gas has been reduced from 2s. 10d. to its present figure of 2s. 6d.

An Empire Health Week Exhibition, to be opened by the Minister of Health, is announced by the Central Council for Health Education, a board of members nominated by the Minister of Health, Associations of Local Authorities, National Health Insurance Committees, and other national health organizations. This involves the opening of a new series of health week campaigns in various parts of the country supported by, and supporting, health exhibitions. The series will open with an Exhibition at Portsmouth, in co-operation with the City Corporation. The Minister of Health, the Right Hon. Sir Kingsley Wood, P.C., M.P., will perform the Opening Ceremony of the Exhibition, which, it is claimed, will be the largest and most important of its kind ever held in England outside London.

We have Received from the British Engineers' Association a copy of their classified handbook of members and their manufactures for 1936. The object of this handbook is to establish a closer contact between buyers overseas and the engineering firms which are members of the British Engineers' Association. It is hoped to achieve this object by spreading more widely a knowledge of their products and facilitating the direct transmission of orders and enquiries to them by providing, in concise but clear form, the information required for that purpose. Copies will be posted to anyone interested in the purchase of British engineering plant or accessories on application to the Secretary, British Engineers' Association, 32, Victoria Street, S.W. 1.

Amalgamation and Grouping

Palatine Gas Corporation, Ltd.

This Company has been formed with an authorized capital of £600,000, divided into £300,000 4½% Cumulative Preference Shares of £1 each, and £300,000 Ordinary Shares of £1 each. The original Directors are Major Julian Day, Mr. George Evetts, and Mr. G. M. Gill.

The Company has been formed to acquire interests in gas undertakings with a view to effecting co-ordination between undertakings which it may acquire in its general area, and an offer has been made on its behalf to the shareholders of the Ashton Gas Company.

Severn Valley and Winsford.

Following negotiations the Winsford Urban District Council has decided to sell their Undertaking to the Severn Valley Gas Corporation, Ltd., at a price of £32,000. A special Council meeting was held on Wednesday evening, May 20, following a discussion among members of the Gas Committee, and Mr. R. G. Barton, Chairman of the Finance Committee, moved "that the terms of the Severn Valley Gas Corporation, Ltd., as set out in their letters of May 15 and 18, 1936, be approved and accepted subject to the execution of an agreement embodying the precise terms and a satisfactory arrangement being made with regard to the taking over of the staff and employees." Mr. Barton stated that the Gas Committee unanimously recommended the Council to accept the offer, and said that when everything had been paid there would be a profit of £20,000 clear for the benefit of the ratepayers. The Gas-Works were originally purchased by the Council in 1904 from the Wharton and Over Gas Company at a remarkably low figure, and expensive improvements have been carried out since then.

Forthcoming Engagements

June.

8.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.

9.—I.G.E.—Council Meeting, 10 a.m.

10.—Association of Statutory Inspectors of Gas Meters.—17th Annual General Meeting, County Hall, Westminster, 10.15 a.m.

16.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.

18.—I.G.E.—Refractory Materials Joint Committee (Stoke-on-Trent), 2.30 p.m.

19.—North of England G.M.A. [Auxiliary Section].—Meeting at South Shields and Paper by Mr. J. R. Porter.

19.—Waverley Association of Gas Managers.—Annual Meeting at Edinburgh.

23.—I.G.E.—Gas Education Consultative Committee, 2.30 p.m.

24.—I.G.E.—Board of Examiners (Oral Examinations), 9.30 a.m.

30.—Southern Association.—Annual Summer Meeting.

July.

2.—I.G.E.—Joint Research Committee at 2.30 p.m.

3.—Manchester District Association.—Manchester Meeting.

8-10.—Canadian Gas Association and North-West Conference Pacific Coast Gas Association.—29th Annual Convention, Vancouver.

24.—Southern Association of Gas Engineers and Managers (Eastern District).—County Meeting at Swindon.

Sept.

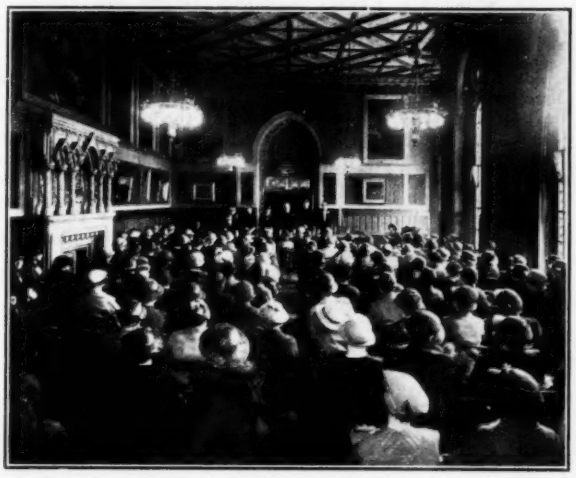
10.—North British Association.—Annual Meeting at Kirkintilloch.

Women's Gas Council

Manchester Branch Inaugurated.

The Chairman of the Manchester Gas Committee (Councillor W. P. Jackson, J.P.) presided at the inaugural meeting of the Manchester Branch of the Women's Gas Council, held in the Lord Mayor's Parlour, Town Hall, Manchester, on May 18.

Over two hundred ladies attended and enthusiastically supported the resolution for the establishment of a Manchester Branch, and more than half that number enrolled before leaving the meeting. The Lady Mayoress of Manchester (Mrs. T. S. Williams) was installed as first President of the Branch.



The Gathering at the Inaugural Meeting.

Miss K. M. Halpin, National Organizing Secretary of the Council, expounded the aims and objects of the movement, while Miss M. M. Robinson, of the Manchester Gas Department, who is the District Organizing Secretary, spoke of the benefits and advantages enjoyed in other districts where Branches had been formed.

The inaugural meeting synchronized with the advent of ideal summer weather, and the refreshments provided in the State apartments were fully appreciated.

Illuminating Engineering Society

A Satisfactory Year

The Annual General Meeting of the Illuminating Engineering Society was held in the Hall of the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W. 1, on Tuesday, May 12, Mr. A. W. Beuttell, President, in the Chair.

The minutes of the last meeting having been taken as read, the President briefly reviewed the work that had been undertaken during the past session, which, he said, had been a period of steady progress. The Society's work had further developed and a number of new departures which it was hoped would prove of considerable benefit had been made. One of the proposals for the improvement of the Society that had been adopted was the formation of sections dealing with special subjects, notably the Photometric section. Other sections contemplated are those to deal with architectural and decorative lighting and industrial lighting which are now being studied. Other proposals adopted included the issue of transactions and the formation of a library.

The efforts made during the past year to arouse interest in the work of the Society have again led to useful additions to the membership list, over eighty applications for membership of all classes having been received and approved. It is hoped that some of the new measures adopted, notably the development of sections devoted to special phases of lighting, will prove helpful in broadening the basis of membership and inducing some of those interested mainly in these special aspects to join. The accounts for the year also reveal real progress, there being an excess of income over expenditure of £139.

For the ensuing session Mr. A. Cunnington was elected President; Mr. Percy Good, Vice-President; Mr. J. S. Dow

continues to act as Hon. Secretary; and Mr. E. Stroud becomes Hon. Treasurer.

Vacancies on the Committee will be filled by the following: Mr. R. O. Ackerley, Mr. Justus Eck, Mr. W. J. Jones, Dr. R. J. Lythgoe, Mr. Howard Loag, Mr. A. R. McGibbon, Prof. J. T. Macgregor-Morris, Mr. E. W. Murray, Mr. J. M. Waldram, and Mr. H. C. Weston.

Following on with the practice adopted in recent years of inviting an expert from abroad to deliver an address, the Society this year had the pleasure of hearing Dr. Merry Cohu, of Paris, describe "Some Aspects of the Question of Reflection from Road Surfaces and Notes on Developments in Lighting in France."

Gas to Heat Coatbridge Baths

Coal Clause Operative

All heating at the new Coatbridge Public Baths and Municipal Swimming Pool and Public Health Offices will be performed by gas as a result of the enterprise of the Coatbridge Gas Company. For this purpose the Company have quoted a reduced price of 2·8d. per therm for a minimum of 50,000 therms per annum, this price to be subject to the operation of a coal clause. For each rise or fall of one complete shilling per ton in fuel, 0·1d. per therm will be added or deducted from the 2·8d. rate. The basic fuel will be washed double nuts, while the basic price will be the existing contract rate of 16s. 6d. per ton at Gas-Works for that material.

Kent Area Salesmen at Neasden

The first official visit of a Gas Salesmen's Circle to the new Works of Ascot Gas Water Heaters, Ltd., at Neasden took place on Wednesday, May 6, when the Members of the Kent Area Circle spent a most enjoyable and instructive day. The above group was taken before the members undertook a tour of the Works. Part of the extensive premises can be seen in the background.

Newport (Salop) Valuation

Not to Sell Gas Undertaking

Considerable discussion took place at a meeting of the Newport (Salop) Urban District Council last week concerning an offer from the Severn Valley Gas Corporation, Ltd., to have a valuation made of the Newport Undertaking with a view to their acquiring the undertaking.

Although several members of the Council were in favour of allowing the Corporation to make the valuation, the Chairman of the Gas Committee (Mr. A. O. Talbot) said that in a few years the Undertaking was going to be a very valuable asset to the town, but in the meantime the consumers had got to bear the burden. In the years to come, however, they would reap a substantial reward, but they must keep their faith.

Mr. A. E. Evans also said in the last few years they had been making profits, and during the last month they had made considerably more gas than ever before, and he thought they would be doing the ratepayers of the town a very unjust service to bar them from enjoying in the future the profits from the undertaking.

The Council eventually decided to take no action in the matter.

National Gas Council

Meeting of the Central Executive Board

A meeting of the Central Executive Board of the National Gas Council was held at the May Fair Hotel, Berkeley Square, W. 1, on Tuesday, May 12, at 11.45 a.m. The Chair was taken by Sir DAVID MILNE-WATSON, LL.D., D.L.

Before proceeding with the business of the meeting, the Chairman referred with very great regret to the death of Mr. H. Shewring, who had been drowned between Weymouth and Lulworth Cove on April 15. He had been elected to the Board in 1935 as representing the Eastern District Executive Board. A letter of sympathy had been sent to the Chairman of the Cambridge University and Town Gas Light Company, who had been asked to convey the condolences of the Board to Mr. Shewring's family.

The death of Mr. J. Lang, of Alexandria, was also reported. He had represented the Executive Board for Scotland since 1930, and was greatly respected by his colleagues and friends in the Industry.

A vote of sympathy was passed, the members all standing in silence.

Nomination for the Office of President.—Sir David Milne-Watson was nominated for the office of President for the ensuing year, in accordance with Rule 4 of the Constitution for recommendation to the Annual Meeting held later that day.

List of Members Appointed to the Central Executive Board.—The list of members appointed to serve on the Central Executive Board (as given in last week's issue of the "JOURNAL," p. 483) was submitted.

Annual Report and Accounts.—The Annual Report and Accounts for the twelve months ended March 31, 1936, were approved for submission to the Annual General Meeting.

Coal Questions.—It was reported that, on March 25, a deputation from the Central Executive Board had met representatives of the Central Council of Colliery Owners and made a strong case against the operation of the Coal Mines Act.

A deputation from the Conjoint Conference of Public Utility Associations, led by Sir David Milne-Watson, had appeared before the Secretary for Mines on April 7, pressing for the amendment of Part I. of the Coal Mines Act, 1930, and strongly opposing the establishment of compulsory monopolies in coal in each district, seeing that no adequate protection was given to consumers of coal.

Coke Oven Questions.—It was reported that on March 17 a meeting had taken place between gas representatives and representatives of the National Association of Coke and Bye-Product Plant Owners, to consider matters affecting the two industries.

National Bodies in Scotland.—It was reported that Mr. J. C. Walker, of the B.C.G.A., who had been acting for the past six months as Resident Officer in Scotland, after making contact with the various Scottish interests, had submitted a report which had been unanimously approved by the National Bodies in Scotland.

The Board approved the recommendations contained in the report in question, and a hearty vote of thanks was passed to Mr. Walker for the success achieved in this matter.

Date of Next Meeting.—It was agreed that the next meeting of the Board should take place on Tuesday, July 14.

Benzole Recovery at Halifax Gas-Works

Official Inspection of New Plant

The Halifax Corporation Gas Department have adopted benzole washing. The plant, illustrated below, has been designed and erected by Simon-Carves, Ltd., of Cheadle Heath, Stockport, and has been installed at the Mulcture Hall Road Gas-Works.

On Monday, May 18, the new plant was officially inspected by the Mayor of Halifax, Councillor W. Brenard, J.P., Alderman J. H. Waddington, J.P. (Chairman), and the members of the Halifax Corporation Gas Committee. Satisfaction was expressed at the efficiency and simplicity of the installation. The Committee were shown round the plant by Mr. W. B. McLusky, Engineer and Manager to the Gas Department, and representatives of the Contractors.

The plant is capable of treating 5 million cu.ft. of purified gas per day and recovering approximately 650 gallons of high quality benzole per day. The washer is of the Simon-Carves static type, consisting of a number of bays containing patented packs built up from small mesh expanded metal. A separate steam-driven Weir pump is provided for circulating the oil over each compartment.

The use of expanded metal sheets provides a very large scrubbing surface per cubic foot of space, and serves to bring the gas and oil into intimate contact.

Static Washer Showing Circulating Pumps.

The benzolized oil—after pre-heating—enters a Simon-Carves benzole still having a number of double-effect distilling sections containing bubbling hoods and seals. Steam is injected into the bottom chamber through perforated pipes, and is controlled by an orifice plate and a pressure regulator so that when once set the amount of steam passing into the still is constant. The vapours from the still pass to a combined fractionating column, heat exchanger, and reflux condenser. The heat exchanger and the reflux condenser are of the horizontal tubular type, with the tube plates forming two of the sides of the unit.

In addition to the pressure regulator controlling the pressure of steam to the still and the thermostat control on the water supply to the reflux condenser, the steam to the oil heater is also thermostatically controlled so that when once set the steam and water supply to the plant correct themselves for variation in load, and the whole plant is controlled by one regulating dial cock controlling the benzolized oil to the plant through a steady-head feed pipe.

Midland Junior Gas Association

Annual General Meeting

The Annual General Meeting of the Midland Junior Gas Association was held at the Council House, Birmingham, on Thursday, May 7. The Annual Report and Statement of Accounts having been formally approved, the PRESIDENT (Mr. F. L. Atkin) announced that the Council had elected Mr. A. W. Attwood (Coventry) as Junior Vice-President. Mr. ATTWOOD, expressing his thanks, said he would do his best to keep the flag of the Association flying.

Mr. S. K. HAWTHORN proposed, and Mr. W. N. SMIRLES seconded, a vote of thanks to Messrs. A. W. Attwood, W. T. Hobson, and F. A. C. Pykett, retiring Members of the Council. The motion was carried.

Mr. H. C. WILLS proposed a cordial vote of thanks to the Officers of the Association, Mr. Alfred Hill, Hon. Secretary; Mr. F. A. Grant, Assistant Hon. Secretary; Mr. George W. Smith, Hon. Treasurer; and Mr. W. P. Timbrell, Hon. Auditor, for their services during the past year, and proposed their re-election *en bloc*.

The PRESIDENT seconded the vote of thanks. Mr. Hill, he said, had had a very trying year owing to illness, but notwithstanding he had carried through the whole of the work of the Association with perfect precision, including the dinner to the Past-Presidents, which had entailed a lot of extra work. The motion was agreed to.

The following were nominated as Members of the Council: Mr. G. E. Stevenson (Long Eaton), Mr. K. L. Pearce (Bilston), and Mr. H. G. Broadbridge (Leamington). On a ballot being taken, Mr. Stevenson and Mr. Broadbridge were elected.

Mr. E. T. PICKERING proposed a vote of thanks to the representatives on the District Education Committee, Messrs. H. R. Hems, W. L. S. Spinks, F. A. Jenkins, W. MacNaughton, and W. J. Pickering, the last-named being the representative from the Joint Council. These gentlemen were always willing to give any help they could to students, and they could not do better than ask them to serve again.

The proposal was seconded by the PRESIDENT and heartily endorsed by the members. Mr. HEMS said it was a matter for satisfaction that so many students had come forward, but it was felt that a peak point had been reached, and therefore he hoped that members, particularly the younger ones, would not fail to take advantage of the education scheme.

On the proposition of Mr. A. W. ATTWOOD, seconded by Mr. W. H. CLARKE, the following alteration to a clause of Rule 6 was adopted: "Members being two years in arrears with their subscriptions shall be notified in writing by the Hon. Secretary, and failing payment of the amount due within 28 days of such notice, shall cease to be Members of the Association."

Mr. F. H. TIDBALL (Coventry) called attention to the fact that questions outside the syllabus were set in the Examinations under the Education Scheme, and suggested the appointment of an additional representative who had recently taken an Examination. After some discussion, the following Resolution, proposed by Mr. J. H. GEE and seconded by Mr. W. L. S. SPINKS, was carried unanimously: "That this meeting deprecates the practice of setting Examination Questions on subjects outside the Syllabus printed in the Education Regulations."

Continued Progress at Elgin

A Proud Achievement

In his annual manufacturing report to the Elgin Town Council, the Gas Engineer, Mr. Peter Low, intimated that the increase of gas manufactured during the year 1935-36 was 9,573,300 cu.ft., or almost 8%, this bringing the increase up to 52,142,200 cu.ft., or 74·48% in seven years.

Leicester's Demonstration Trailer

Our photograph is of the new Demonstration Trailer of the Leicester Gas Department. We are indebted to Mr. James Mitchell, M.I.Mech.E., Engineer and Manager, for the following interesting details of this vehicle, which has been designed as a travelling showroom for use in outlying districts. It is proposed that the trailer shall be left in each district for ten days to a fortnight. The van has been carcassed for gas and can be connected direct to a gas main, while a number of bayonet fittings have been provided so that apparatus can be demonstrated. As the photograph shows, there are two large windows on each side of the van. There are also lights at each end, and shutters of dark blue "Prestwood" which fitted to the windows protect the glass when the van is unattended. The interior is lighted by two powerful Sugg gas lamps from the ceiling.

The basis of the vehicle is a special "Carrimore" low trailer chassis, with small pneumatic-tyred wheels. The body is by Messrs. Manhire, Chandler & Co., of Stonebridge Park, London. The van has 7 ft. 2 in. headroom and the overall length of the vehicle is 21 ft. It is painted with the Department's standard colours of two shades of blue with gold lines, and inside the body is panelled with gold mottled and grained rexine with mahogany mouldings. The flooring is of thick rubber "Parafloor," edged with polished mahogany boards.

The Open Coke Grate

by F. M. H. TAYLOR

In this contribution the Author considers the Open Coke Grate from the angles of Design, Construction, Type, Economics, and Sales Policy.

The Uses of Coke in the Open Coke Grate.

The open fire as a heating appliance is neither so easily controllable nor so completely understood as the majority of appliances for consuming all types of fuel for domestic purposes. The room itself is heated by direct radiation from the fire by reflected radiation from the walls as well as re-radiation from the walls and furniture in the room which have previously been warmed. There is, in addition, heating by conduction and convection from the front of the fire. All these are indefinite quantities.

Warming a room is effected by conditions not at first associated with the open fireplace. For example, if a window is directly opposite the fireplace, it is extremely difficult to maintain comfortable conditions in the room because the heat of the fire is radiated directly out of the window and is, therefore, not re-radiated back into the room as is the case when a plain wall or piece of furniture is opposite the fireplace.

The chimney does not draw the air entirely through the fuel bed, but through the fuel bed under the ashpit and over the top of the fire, where it can consume carbon monoxide formed in the deep fuel bed, thus giving a flaming effect. The biggest proportion of air flowing up the chimney, however, is drawn up direct from the room without passing through the fire. While preventing excessive combustion of fuel, this stimulates the ventilation in a room. The greater the proportion of ventilation, however, the more heat required to counteract the influx of cold air, and it is desirable to check the induced ventilation to a certain extent. This is accomplished by restricting the flue opening by sloping the back fire brick forward at the top. This construction has an additional advantage of reflecting the greater proportion of radiant heat from the fire out into the room, and thus increases the overall efficiency of the fire.

The effect of increased rate of combustion on the efficiency of the fire has been discussed previously, and it will be noticed that varying the rate of combustion, while naturally varying the output of the fire, does not give any appreciable scope for improving the efficiency.

General Features of the Open Coke Grate.

While the principle of design is the same for all open grates, there are a number of small ways in which the open coke grate differs from that designed primarily for coal or semi-coke. Examination of typical grates will show that:

The grate bars are preferably of wider spacing.

A row of front bars or a grate sloping downwards from front to back is desirable in order to give a thick fuel bed and thus maintain a large body of hot fuel to support combustion because it cannot radiate heat from its surface. A good draught is necessary as the thick fuel bed can only pass sufficient air with a strong draught.

A very narrow distance from back to front is not desirable, as it requires a thick fuel bed since the coke is not naturally so flexible as some of the alternative fuels. An efficient means of regulation of the fire is essential.

The high temperature obtained with the coke grate makes a really first-class brick lining to the fire an essential feature.

The necessity for the removal of the ash from time to time in order to maintain a reasonably bright fire makes a simple means of cleaning the grate desirable, and a number of grates have a simple shaking device attached.

The gas ignition or gas poker is a useful adjunct to a fire, as it improves the ease of ignition out of all proportion and, in practice, no fires are fitted without this simple accessory.

Grate Bars.—The minimum front air spacing to the bottom of the grate is $\frac{3}{4}$ in. between the fire bars, as distinct from $\frac{7}{16}$ in. to $\frac{3}{4}$ in., usually provided with the coal grate. Unless there are front fire bars, a grate should slope downwards to the back of the fire. In types of grates having the front fire bars, the slope may be upwards to the back, and it has been shown that it is possible to increase the radiant efficiency of the fire, especially when having a large dimension from front to back by a grate sloping upwards to the back. The fire bars are made from ordinary foundry cast iron of between 2% and 4·5% carbon.

Fire Sizes.—The very small fireplace is not satisfactory for use with coke, and the size is usually fitted varying from 11 in. to 18 in., and would of course go up to much larger sizes for large halls. The width at the back of the fire varies from 8 in. to 12 in., and the depth of the fire may vary for the different makes from 6 in. to 9 in. A simple rule for fire size is to make 1 in. of grate width for each foot of average dimension, that is, for a room 11 ft. by 11 ft. an 11 in. fire is required, and a room 16 ft. by 16 ft. a 16 in. fire. One fire is described by Dr. Fishenden (World Power Conference, 1928, Paper No. L5) as decreasing in efficiency from 21·9% to 12·4% with an increase in depth of $3\frac{1}{2}$ in. to 12 in.

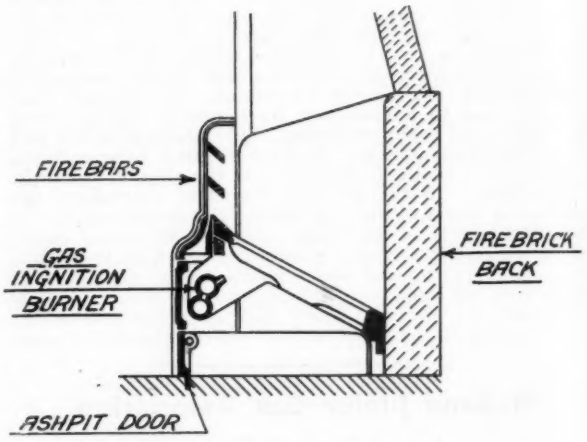


Fig. 1.—The construction of a typical open coke grate.

Brick Insulation.—A good quality back fire brick is essential for the following reasons:

(1) The coke fire is hotter, and there is, therefore, more conduction from the walls at the back of the fire, but the more intense heat of the coke fire is likely to crack and spoil an inferior quality fire brick.

(2) The fire brick must retain the heat of the fire sufficiently well for the coke to keep the high fuel bed temperature which is necessary adequately to support combustion.

The best type of fire brick is the " acid " alumino-silicate of composition 64% silica 34% alumina, not more than 1% alkali, a small proportion of iron oxide, and traces of lime and moisture. The fusion point is 1,700° C., and the expansion in use is 0·9%. The crushing strength is 1,800 lb. per sq.in.

Fire Fronts and Finish.—The usual type of coke grate has a set of grate bars in the front unless the grate slopes downwards.

The finish of the grate must be of vitreous enamel of various colours or of chromium plate, as the intense heat of the fire discolours cheaper finishes.

Gas Ignition.—The burner is made of $\frac{1}{4}$ in. solid drawn steel tubing fixed to the side pillars approximately $3\frac{1}{2}$ in. from the hearth. The gas ports are controlled in a straight line, one to each space between the grate bars, so that the gas flames will pass through the fire bar spacing and not impinge on the grate bars. When correctly adjusted, the gas jets will be between $9\frac{1}{2}$ in. and 10 in. long, with a gas rate of 50 cu.ft. per hour for fires of between 12 in. and 16 in., and proportionately more for the large grates.

Regulation of a Fire.—The air entering under the grate is normally controlled by the air slide, rather than by the infiltration of air by the side of the grate front. In order to obtain accurate control, the fender to the fire must be a close fit, and the ashpan must fit closely to the fender.

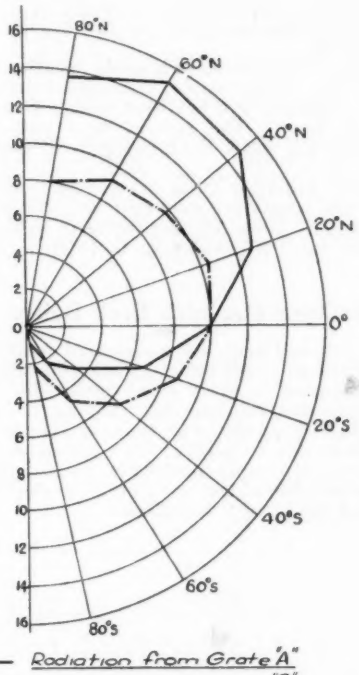
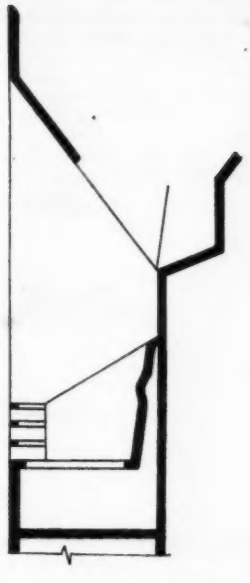


Fig. 2.—Chart comparing the heat distribution of a well-grate (Fig. 2a) with that of a raised grate with bars (Fig. 2b).

"A"- Well-grate without bars

Fig. 2a.



"B"- Raised grate with bars

Fig. 2b.

Where grate rockers are installed, there is a hole in the underside of the grate which cannot be completely controlled, and is recognized as a disadvantage to this type of grate.

The use of a damper in the fire register has been advocated by Dr. Margaret Fishenden in a number of her publications (F.R.B. Special Report No. 3, 1920, "House Heating") and has been adopted by one or two manufacturers.

The value of flue restriction lies in:

(1) The avoidance of excessive dilution of flue gases and a small reduction in the output of the fire.
(2) The prevention of excessive draughts which are sources of discomfort and require an unnecessarily high fuel consumption in order adequately to warm the occupants of the room.

In most makes of fire there is a permanent restriction formed by sloping the back of the fire forwards until a relatively small aperture only remains.

Types of Grate.

Perhaps the best known is the "Metro" developed by the South Metropolitan Gas Company. This has deep front to back dimensions, a grate sloping downwards, and consequently a deep fuel bed. It burns much more fiercely, and has a greater fuel consumption, and, because of its deep fuel bed, secondary reduction from carbon dioxide to carbon monoxide takes place, to which may be attributed the flaming appearance of the fire. Carbon monoxide burns with a bluish flame, rendered luminous by the small quantities of volatile matter or coke dust present, and goes far to counteract the advantage claimed by the coal fire, that is, the provision of a flame.

A typical non-flaming fire is the "C.C.," and although this has a thick fuel bed compared with the other solid fuel grates, it is much more shallow than the "Metro."

A gas fire attachment provides for occasional use, particularly in the spring and autumn, and times when the day temperature does not warrant lighting the coke fire.

The "Kempton" is a slower burning fire than the "Metro" and does not produce the same long flames, but it has open front bars showing the fuel bed. The bars are curved, and are set at an angle, which prevents the accumulation of fine ash.

Most manufacturers make a basket type fire which can be stood in a large open hearth or inset fireplace having a canopy connected direct to the flue.

Hales Fire Back.

This device (Brit.Patent No. 37,948) consists essentially of a polished aluminium sheet false back about 2 in. from the back of the grate, connecting from the top of the fire down to the usual fuel level. By means of this simple attachment, the chimney draught can be concentrated on the fuel for quick combustion, and the intensity and distribution of radiant heat, as well as the general appearance of the fire, are improved by reflection from the polished surface.

The draught may be regulated by the opening or closing of the canopy, and a number are known to be working successfully in Government offices.

Where the polished aluminium foil is attached by cement to the back, the same advantages of reflection of radiant heat are obtained.

Fig. 3.—The combined open fire grate with back boiler having a removable gas burner for water heating in the summer.

[*By courtesy of the Ideal Boiler Co., Ltd.*]

The aluminium sheet or foil remains bright and apparently new for a considerable period, under normal working, and a damp cloth is all that is necessary to maintain the equipment in first-class condition.

Chimney Pull.

The slightly increased temperature of a room when compared with the outside atmosphere is usually sufficient to give a pronounced chimney effect in the flue, so that from the moment of attempting to light the solid fuel fire, a chimney pull is available.

Thus, by increasing combustion in the grate, still more heat is given to the chimney, and a still higher pull obtained, until the chimney pull due to hot gases in the chimney is counterbalanced by the ever-increasing resistance to the passage of the gases up the chimney, which is

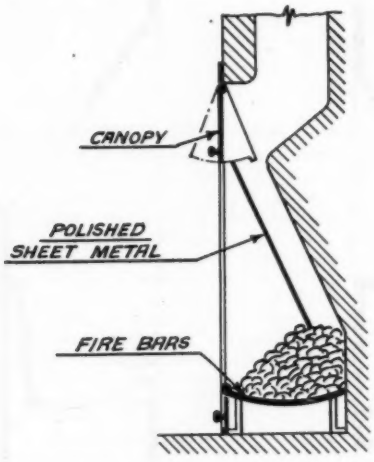


Fig. 4.—Diagram showing the Hales fire back for increasing the radiant efficiency of the open fire.

increased as the quantity and velocity of these gases increases. The chimney pull (P) expressed in inches of water is given by the following formula:

$$P = 7{\cdot}7\,h\,\frac{1}{T_2} - \frac{1}{T_1}$$

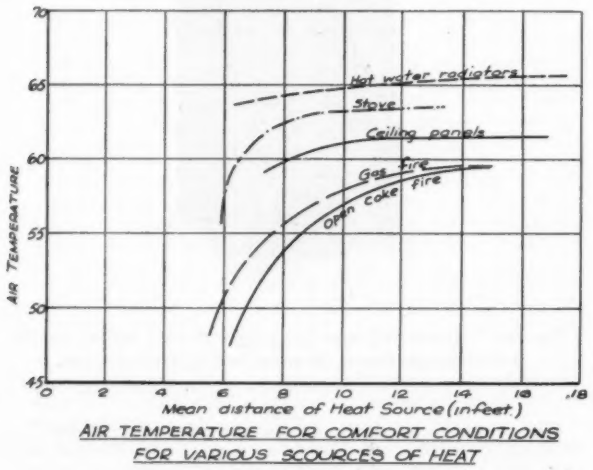
h being the height of the chimney in feet, and T_1 and T_2 temperatures in degrees fahrenheit absolute of the flue gases and outer air respectively.

Normally, the chimney temperature is 50° F. above the outside temperature, a large proportion of heat being lost by conduction up the chimney, from the walls of the chimney, and by cold air from the room being drawn up the chimney.

The calculated pull of a 35 ft. chimney at 50° F. temperature difference between the chimney and the outside air is about 0·05 in. of water, increasing to 0·09 in. for 100° F. temperature rise. This would generally account for the movement of some 5,000 to 30,000 ft. of air per hour, according to circumstances.

Rates of Combustion.

The average open coke fire when fully stoked and cleaned consumes fuel at the rate of 3·5 to 4 lb. per hour per sq.ft. of grate area, falling to perhaps half the figure as the



AIR TEMPERATURE FOR COMFORT CONDITIONS FOR VARIOUS SOURCES OF HEAT

Gas fire rates ~ 30 Cu ft per hr

Fig. 5.—Chart showing the varying air temperatures for equal comfort conditions with various methods of heating.

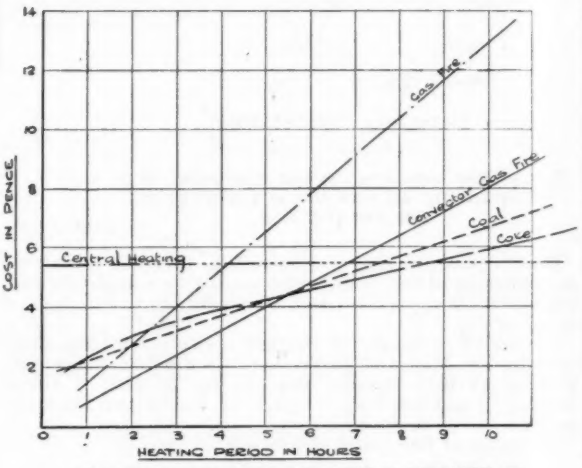
amount of ash accumulates. The coke, naturally, has a higher minimum rate of combustion than a corresponding coal or semi-coke fire, as a reasonably high rate is necessary to maintain the fuel bed at a sufficiently high temperature to be well above the ignition temperature of the coke, and also maintain the flexibility of the fire and prevent the coke going out.

The quantity of fuel used, previously mentioned, varies from 1 lb. for the "C.C." and "Kempton" to 2½ lb. per hour for the "Metro," and the heat output from 4,000 to 10,000 B.Th.U./hour. The radiant heat output of the fire is approximately 4,000 B.Th.U./sq.ft. of exposed surface.

The secondary radiation from the fire back and convection accounts for a heat emission over and above that due to direct radiation. These fires are sufficient to heat a room 12 ft. by 12 ft. for 9 ft. height up to 15 ft. by 20 ft. for 10 ft. height.

The Open Fire with Back Boiler.

One or two types of grate have appeared recently giving the open coke fire and back boiler an addition which allows for domestic supplies in every small house, but has been utilized in other installations for running a small centralized circuit, and, at the same time, maintaining the attractions of the open fireplace. This arrangement solves the problem of adequately heating a large hall without sacrificing the benefits of the open fire. Examples are the "Bristol" and the Ideal "Neo-Classic."



— COMPARITIVE COST OF VARIOUS METHODS — OF HEATING

Fig. 6.—The effect of the Occupancy Factor on the relative Costs of Heating by Central Heating, Gas, and Solid Fuel Fires.

The appreciation that a special type of grate is necessary in order to burn coke effectively justifies gas undertakings taking very special care themselves over manufacture and distribution of a coke grate. Once the coke grate has been sold it automatically sells coke itself.

The Economics of Space Heating.

The open fire is not only justified from comfort and health conditions, but for normal usage of the room, as the most economical method of providing heat when both fuel costs and capital and installation costs are taken into consideration, depending on the amount of use to which the room is put, and the accompanying graph shows how the relative costs of the gas fire, convector gas fire, coal and coke fires, and central heating vary according to the number of hours of use. For less than two hours' occupancy at a time, the gas fire is cheaper than the solid fuel fire, as well as being incomparably more convenient. For periods of less than eight hours, the solid fuel fire is less expensive than the central heating, and, while it is almost the same cost for periods up to 4 or 5 hours, for all day heating the coke fire is definitely cheaper than coal, and these figures are based on current prices for fuel prevailing in London at the time of writing.

One of the attractions of the open fireplace is that the air temperature may be as low as 45° F. in the room, and yet with a good fire the occupants may be perfectly comfortable. Indeed, the low air temperature with radiant heat gives a feeling of freshness which is not obtained with purely convected heat. The movement of the air in the room caused by the air change in the open fire flue adds to the feeling of comfort of the occupant.

As an illustration of the varying air temperatures required to maintain comfortable conditions in the room for various types of appliances, it would seem that the gas

fire and coke fire as sources of high temperature radiant heat will maintain the comfort conditions with very much lower room temperatures than the alternative methods of room heating, such as central heating or convection type stoves.

Coke Fire Installation.

The salesman or gas inspector making contact with the consumer decides on the type of fire and measures the flue opening for size, &c. He also decides whether a grate back is required, and then gives instructions to the manufacturer. In order to avoid mistakes and annoyance to consumers, the fitter should take a range of fires and complete fire brick equipment in addition to auxiliary gas ignition fittings. The fire is then fixed by one operation and extra visits to the consumer are thereby avoided.

The sales of the domestic coke grate might well be encouraged by every gas manager. By a vigorous sales campaign, one salesman can install 20 to 30 fires per week. Apart from the small profit on the fire, the salesman has sold 60 tons of coke per annum and a gas poker consumption of 300 therms per annum. Also, some 20 to 30 families have been impressed with the resourcefulness of the Gas Industry and have learnt how gas can be used for a variety of domestic purposes.

These consumptions will go on year in and year out, without further sales effort on the part of the Company, and all for one week's work!

Croydon Gas Company's Co-Partnership Meeting

Steady Progress of Scheme.

There was an excellent gathering at the Fourteenth Annual Co-Partnership Meeting of the Croydon Gas Company, held on Monday, May 25, at the North End Hall, Croydon.

After half-an-hour's community singing, the Chairman of Directors, Mr. William Cash, J.P., F.C.A., took the chair, and proceeded to submit the Co-Partnership Scheme Report and Accounts for the year ended March 31, 1936. Before dealing with these, however, Mr. Cash extended a hearty welcome on behalf of the Directors and the Company to all those present, and referred with pleasure to the fact that the General Manager, Mr. W. J. Sandeman, was back with them again after his serious illness. Having touched briefly upon the advantages of co-partnership in an undertaking of their nature, to whose benefit, if properly infused in them all, the spirit of co-partnership would essentially work, the Chairman went on to deal with the various items in the report, which stated at the outset that the bonus for the past year was maintained at the rate of 7%, as in the previous year, this being the rate of dividend paid on the sliding scale stock of the Company for the year ended Dec. 31, 1936.

The bonus amounted to the sum of £13,562—an increase of £386 on the previous year; and of this sum £7,193 had been used to meet the remaining contributions to the Pension, Widows' and Orphans' Fund, this leaving £6,368 available in the co-partners' account for investment purposes and their own use. The sum of £9,455 had been paid in during the year as savings, showing a satisfactory increase in this direction of £976. An increase of £1,204 in the amounts withdrawn included amounts paid to members leaving the Company's service. The amount applied to pension fund contribution was £107,867. The nominal amount of the Company's stocks standing in the name of co-partners, annuitants, and the trustees of the fund, on behalf of the co-partners, on March 31, 1936, was £46,108.

The Club formed in connection with the Croydon Nursing Service now had a membership of 79, while a sum of £297 was collected for the Hospital Fund during the year, making a total of £2,706 collected since the scheme was started, the total payments out being £2,415. The Company had also contributed £250 to the Local Hospitals during the year. The Committee also recorded its thanks to Mr. M. O. Coates, the Editor, for the continued excellence of the *Co-Partnership Magazine*, the circulation of which during the past four quarters was respectively 1,520, 1,431, 1,586, and 1,574.

Sound Investments.

The trustees of the Pension, Widows' and Orphans' Fund had made investments during the year of £72,189. The total book value of the investments was £399,853, their market value on March 31, 1936, being £468,469. The balance at credit of this Fund was £440,109, as compared with £402,316 twelve months before. The Chairman referred to the statement of investments and drew attention to the sound concerns in which the money was placed, including Government stocks, Colonial stocks, debenture stocks, as well as several other holdings in gilt-edged securities, including a number of water undertakings, which, in the Chairman's opinion, were the soundest of all—for everyone had to have water.

Mr. Cash went on to refer to the loss the Company had sustained by death of co-partners during the year, mentioning particularly Mr. Charles Hussey and Mr. Rigby, both Directors of the Company. The former had been on the Board for 45 years at the time of his resignation at Dec. 31, 1935. He had been Chairman of the Co-partnership Committee for many years and took the greatest interest in the scheme. Mr. Rigby had been Deputy-Chairman of the Company from 1901 to 1932. These two wonderful old gentlemen, said Mr. Cash, both lived to within a few weeks of reaching the great age of ninety, and they both devoted a great deal of time to the interests of co-partners and the Company.

It might interest them to know that to fill the vacancy caused on the Board they had appointed Mr. E. E. Bird, who was an eminent solicitor in London, a member of the Council of the Law Society, and had recently been appointed Chairman of the Legal and General Assurance Society, Ltd. He had taken up his new duties with their Company with much zest and zeal.

Speaking of the progress of the Company as a whole since the previous co-partnership meeting, Mr. Cash observed that they had issued some maximum dividend stock in Croydon at 114. They offered £75,000 and received applications for just under £500,000, which seemed to indicate that the Gas Company was popular in Croydon. Then they had opened temporary showrooms at Carshalton; they had installed new electrical generating plant as a standby at the works. Another piece of land had been acquired for showroom purposes in West Wickham. Another matter of interest was that Mr. J. M. Webber was that year President of the London and Southern District Junior Gas Association, and members of that body to the number of some 140 had visited the Croydon Gas-Works recently. There had been an increase in the sales of gas of 2·59%. Their showroom sales of appliances had increased by £38,403 to £128,326, being a record in the history of the Company and showing very good work in the showrooms.

Croydon, continued the Chairman, was rapidly becoming an industrial centre. At the present time there were over 880 factories and workshops in their area using gas in 119 different processes. The Company was also doing more good work through the medium of their lady demonstrators, who visited the homes of consumers to show them how to get the best out of their gas appliances.

The Coal Situation.

They would have seen a great deal of reference lately, continued Mr. Cash, to the coal industry, and this matter was a very vital one to them whether as workers, shareholders, or co-partners. They would have seen that the Croydon Company had agreed, along with other gas and electricity undertakings, to pay an extra shilling per ton voluntarily on the price of their existing coal contracts, which was to be applied as increased wages for the miners. As a result of this they had to increase the price of gas very slightly. But if the price of gas were to rise to any great extent then the consumers would begin to feel it—so that the matter therefore concerned not only them as co-partners and Directors but it also concerned their consumers.

Any serious increase in the price of gas had a tendency, of course, to check consumption. In this matter, he was happy to say, gas, electricity, and water undertakings were all meeting together; and the thing which particularly concerned them was the policy which seemed inclined to differentiate against public utility undertakings on the assumption that they could stand the increase by reason of the

fact that they could pass it on to their consumers. That was, of course, perfectly true. But public utility undertakings were what were termed quasi monopolies—and they were controlled in their operations by Parliament.

What they regarded as so serious were the coal selling schemes which had been formulated without any real safeguard to ensure that they worked fairly. They were very anxious that there should be no discrimination against public utilities; what they were pressing for was some means of access so that they could obtain information as to the prices which were being charged, in order to ensure that they received the quality of coal which they required for their plant, and so that they could have some sort of tribunal to whom they could apply in cases of difficulty. They were not asking anything unfair; they were prepared to pay a proper price for the commodity they had to purchase, but it was important that there should be some measure of control so that such matters were placed on a fair and proper basis. Of course, if they looked forward at all, it would be quite clear already that in consequence of trade improvement the prices of other things were tending to drop, so that the Gas Industry did not want to be burdened with unfair prices.

On the invitation of the Chairman, Mr. E. E. Bird addressed a few words to the meeting. He regarded it as a great honour, he said, to be invited to become a Director of this Company in succession to Mr. Hussey. He believed that it was the duty of a Director of any undertaking such as this to identify himself with organizations like their co-partnership scheme, and such would be his own utmost endeavour.

Mr. O. Arnold (Chairman of the Co-Partners' Representatives on the Co-Partnership and Works Joint Committee) then presented the Representatives' report for the year ended March 31, 1936.

In spite of certain adverse circumstances, he observed, their organization had emerged triumphantly, and they were able to congratulate co-partners that the bonus had been maintained at the excellent rate of 7% on wages and salaries, and that the Directors had again been pleased to augment the Company's contribution to their Pension Fund by the allocation of a further £10,000, thus bringing the capital sum well on the way to half-a-million pounds. On behalf of the co-partners they desired to express their deepest thanks to the Directors and Management for such an achievement.

While it was noted that during the year there had been an increase in the amounts withdrawn by co-partners, it was very gratifying to see that the annual rate of increase in savings by co-partners had gone up from about £150 per annum during the preceding five years to £529.

Their monthly meetings, he went on, had been held regularly, and, although nothing of particular importance had arisen, many questions on their everyday working had come before them for consideration. Among the matters considered had been the advancement of certain employees, classification of fitters' mates, and the occasional delays which had occurred in the receipt of wages and sick pay. The Committee wished to record their thanks to the secretaries, officials, and stewards of their various sports grounds for their good services in the promotion and arrangement of their games, competitions, &c.

It was with very great regret that the Committee learned that Mr. R. Richardson had decided to retire from his position as Secretary to the Co-Partners' Representatives—a post he had filled with great devotion and zeal during the past fifteen years. It was felt that some recognition of his great services should be made, and the Committee were pleased to report that in view of a very generous response on the part of co-partners, a suitable testimonial to him had been arranged for. As his successor, Mr. G. A. Stringer had been elected.

The Chairman thanked Mr. Arnold for his report, remarking that the Committee were by no means idle, but did a great deal of work. He went on to present to Mr. Richardson a framed testimonial for his services to the Committee during the past fifteen years, remarking that a more tangible gift in the form of a bureau was also to be presented to him. Mr. Richardson, he said, had done a great deal to foster the smooth working of the Committee.

Mr. Richardson duly acknowledged the presentation, after which Long-Service Certificates were presented by the Chairman to the following co-partners upon the completion of 25 years' service with the Company: J. S. Batten, C. C. Brunning, A. E. Cooley, C. A. Dale, D. Daragon, G. Geary, E. E. Hardy, H. T. Isted, J. C. A. Lees, T. W. Mason, H. J. May, H. Nixon, J. Pearce, A. E. Richardson, T. H. Rogers, A. Simmons, A. J. Steer, W. F. Whiteman.

A hearty vote of thanks to Mr. Cash concluded the business of the meeting, and, after refreshments had been served, the remainder of the evening was devoted to lighter fare in the form of a variety entertainment, which was much enjoyed.

Gas Undertakings' Results

Belfast.

Record figures again mark the annual report of Belfast's Gas Undertaking and Mr. J. D. Smith, Engineer, Manager, and Secretary, has received the congratulations of his Committee on the eminently satisfactory working of his Department. There has been an increase of 173 million cu.ft. in gas sales over last year; a new maximum daily output record of 18,768,000 cu.ft., and a maximum weekly output record of 120,915,000 cu.ft. The gross profit on the manufacture and sale of gas and residuals was £143,512, an increase of £8,053. Dividends and interest on reserve funds' investments amounted to £5,852; sinking fund interest, £5,747; and rents from property £482, giving a total of £155,593. From that amount there had to be deducted £67,673, which included income-tax, stamp duty, &c., leaving a net profit of £87,920. Sales of gas totalled 4,549,038,900 cu.ft., an increase of 3·94%, while the gas made amounted to 4,594,794,000 cu.ft. This total surpassed the previous best by 147 million cu.ft. The unaccounted-for gas has again been reduced and now stands at the almost negligible figure of 0·996%. The sale of gas through ordinary meters showed an increase of over 32 million cu.ft. and represented 55% of the total sales. An increase of 94 million cu.ft. was recorded through prepayment meters, representing 35% of the total. Capital expenditure amounted to £72,680, which pointed to a very satisfactory state of affairs. With the rapid development of the outlying districts a further 25 miles of new mains has had to be laid to cope with the ever-growing demand for gas. Gas supplied for public lighting was 428 million cu.ft., an increase of 43 million cu.ft. Sales of cookers, fires, and other apparatus have exceeded all expectations. The Department has 29,057 cookers and 2,208 heaters on hire and during the year sold 3,949 of the larger gas appliances.

Blackburn.

The report of the Blackburn Corporation Gas Department for the year ended March 31, 1936, shows a profit of £4,101, enabling an outstanding debit of £3,679 to be cleared off and a net surplus of £422 to be carried to reserve. Total expenditure was £119,451 against £119,709, a reduction of £258, and income was £183,062, against £184,066, a difference of £1,004, with a gross profit of £63,610, against £64,356. After payment of various statutory charges, amounting to £57,417, with an income-tax charge of £7,829, there remained a net profit of £4,101. The gas made totalled 1,079,671,000 cu.ft., an increase of 32,911,000 cu.ft., or 3·05% over last year. Total wages for the year reached £44,214 against £43,181, equal to 10·74d. per 1,000 cu.ft. of gas sold. The value of appliance sales through the showrooms totalled £23,740, an average of £475 per week, against £480 per week the previous year. Balance outstanding on hire-purchase agreements was £48,976, represented by 15,592 creditors, or an average per head of £3 2s. 9d., against £3 3s. 8d. last year. Coal carbonized amounted to 48,066 tons, against 48,848 tons, a decrease of 782 tons. The gas made per ton was 22,462 cu.ft. against 21,450 cu.ft.—a result not previously achieved. Coke made was 8·14 cwt. and tar 15·99 gallons per ton. A reduction in gas charges on a sliding consumption basis was put into operation for the March quarter, to the advantage of all large consumers.

Stalybridge.

The Engineer and Manager of the Stalybridge Gas Department, Mr. R. J. Restall, recently placed before his Committee the following official gas figures showing the gas consumption for the year ended March 31, 1936. The output shows an increase of nearly 20 million cu.ft. Ordinary consumers show a slight decrease equal to 1·57%, but prepayment meter consumers used more gas, the increase being 5·81%. Appreciable developments have been made with industrial concerns in the town, several important conversions having been made. This has resulted in an increased consumption of 57·69%, and a new departure for floodlighting advertisement posters has resulted in the use of gas for this purpose to the extent of 146,000 cu.ft., which is recognized as being small, but is the beginning for the use of gas for other purposes. Despite a reduction in the rating of gas used on public lamps equal to 18½%, public lighting shows an increase of gas consumed equal to 1·21%. A reduction in unaccounted-for gas has been made from 9·81% to 7·94%. The increased output this year is higher than any for the last twenty years, with the exception of the year 1926-7.

Wales and Monmouthshire Association

Visit their President

The charmingly situated works of the Monmouth Gas and Water Company, showing the Woodall-Duckham Vertical Retort House on the left.

The Annual General Meeting of the Wales and Monmouthshire Association of Gas Engineers and Managers was held at Monmouth on May 21 under the Presidency of Mr. H. MATTERFACE (Engineer, Manager, and Secretary of the Monmouth Gas and Water Company).

There can be few more attractive places in which to hold a meeting than the beautifully situated and historic Ancient Borough of Monmouth, and during the gathering there of the Wales and Monmouthshire Association the countryside was at its very best. Monmouth may not have retained much to suggest the fighting spirit of the bygone times of King Henry V., who was born there, except the name of Agincourt Square, which is the centre of its business life; and it may, perhaps, possess little more to suggest the present-day restless spirit of progress than the imposing monument standing before the Shire Hall, in the Square, to the Hon. C. S. Rolls, son of Lord Llangattock, who lost his life at the Bournemouth aviation meeting in 1910. What the borough and the whole of the Wye Valley do suggest in overflowing measure is enduring peace. Natural beauty abounds, and it is all of a quiet and restful character. As the accompanying photograph shows, even the works of the Monmouth Gas and Water Company have been designed to harmonize as fully as possible with their delightful surroundings.

For golfers there is a sporting nine-hole natural course rather more than a mile from the town, and here it was that the proceedings opened on the Wednesday morning, when the "Upjohn" cup was played for. This was followed after lunch by the competition for the "Wilfred Dean" cup. In the evening the customary informal dinner took place in the Beaufort Arms Hotel, Mr. R. J. Auckland in the chair. On the proposition of Mr. Auckland, a very cordial vote of thanks was passed to the Monmouth Golf Club for having placed their course at the disposal of the members, and for their kindly welcome. The professional and others had gone to a great deal of trouble to put everything in first-class order, and all the players had a thoroughly good time. The vote of thanks was acknowledged by Mr. S. Davis Taylor, who represented the Golf Club at the dinner. It must be added that the day's play had been organized in the usual thorough manner by Mr. Joe Sadler, who finds time on these occasions to look after everybody but himself.

With the exception of the cups (which were handed over on the following day), the prizes were presented to the winners by Mr. G. H. Powell, the Chairman of the Monmouth Gas and Water Company. The results were as follows:

UPJOHN CUP.

	G.	H.	N.
F. Boardman (Cardiff)	83	16	67
Eric Jones (Birmingham)	91	24	67
E. S. Allen (Weston)	83	14	69
H. Matterface (Monmouth)	86	16	70
J. Sadler (Newport)	89	17	72

F. Boardman won the cup on first nine holes.

WILFRED DEAN CUP.

E. S. Allen	2 down
W. Clark Jackson (Neath)	2 ,,
W. M. Fox (London)	3 ,,
C. R. Averill (London)	4 ,,
H. Matterface	4 ,,

E. S. Allen won on first nine holes.

BUSINESS MEETING.

On the Thursday morning there was a large attendance in the Rolls Hall, where the business meeting was held, under the Presidency of Mr. H. MATTERFACE. Many of those present recalled having luncheon in the same hall, on the occasion of the Wye Valley excursion, which was not the least of the many features of the Cardiff Meeting of The Institution of Gas Engineers eight years ago. It is a large and well-appointed hall, for which the town is indebted to the first Lord Llangattock.

At the opening of the proceedings the members were welcomed to Monmouth by the MAYOR (Councillor the Rev. Owen Jones), who remarked that in many ways Mr. Matterface was quite an institution in the town, and he congratulated him upon being President of so useful an Association.

The HON. SECRETARY (Mr. Octavius Thomas) read the minutes of the last meeting, and thereafter the following additions and alterations were made to the membership list: New Members—Charles E. Pritchard (Assistant Manager and Secretary, Monmouth Gas and Water Company); T. B. Walker (Bristol), transfer from Associate to Member. From Students to Members—J. H. Canning, Jnr. (Manager and Secretary, Welshpool Lighting and Power Company); C. R. Monroe (Assistant Engineer, Cardiff Gas Company); H. E. Taylor (Shift Engineer, Cardiff Gas Company); and R. E. P. Hoskin (Shift Engineer, Cardiff Gas Company). Associate—H. W. Haddow (Lighting Trades and Welsbach Light Company).

The proposer was Mr. T. WILKINSON (Abercarn), and the seconder Mr. H. G. HORWOOD (Bridgend).

The statement of accounts and the report of the Council for the past year were adopted, on the motion of Mr. W. T. KENSHOLE (Merthyr), seconded by Mr. R. J. AUCKLAND (Cardiff).

In their thirty-first annual report, the Council stated that during the year five members and six associates joined the Association, one associate and four students were transferred to full membership, one member and one associate resigned, and one associate died—leaving the numbers at the end of the year: 84 members, 4 honorary members, and 55 associates.

The receipts for the year amounted to £139 6s. 2d., and the payments to £127 5s. 8d., leaving, with the balance

brought forward, the sum of £45 19s. 5d. in the hands of the Treasurer, with £100 in 2½% Consols.

New Office-Bearers.

The following office-bearers for the ensuing year were appointed:

President.—H. D. Madden (Cardiff).

Vice-President.—J. Stephenson (Aberdare).

Treasurer.—J. H. Canning (Newport).

Hon. Secretary.—O. Thomas (Cymmer).

Auditors.—A. E. Pask (Caldicot) and D. Muir (Pontypridd).

Members of Council.—J. F. Rust (Newport) and W. T. Kenshole (Merthyr).

The PRESIDENT, proposing the election of Mr. Madden as the next President of the Association, explained that the Cardiff Gas Company would be celebrating their centenary next year, and it appeared to the Council to be a suitable occasion upon which to do honour to Mr. Madden, who was held in the highest esteem by everyone in that district, and, indeed, in the whole of the Gas Industry. They had therefore asked him to take the chair next year. It was the wish of the Vice-Presidents that this should be done.

Mr. J. STEPHENSON (Aberdare) said that, as Senior Vice-President, it gave him great pleasure to second the proposition. The bonds between the Association and the Cardiff Gas Company, and Mr. Madden in particular, were so close as to make them practically inseparable, and it was very fitting that the centenary of the Company should be marked by the election of Mr. Madden as President.

The proposition was carried with applause.

On the motion of Mr. OCTAVIUS THOMAS, seconded by Mr. D. MUIR, it was agreed that the Association should subscribe ten guineas to the Benevolent Fund of The Institution of Gas Engineers. Mr. Thomas added that the Fund needed more money, and should members feel inclined to give a little extra he would be very glad.

An Efficient Undertaking.

Mr. W. H. JOHNS (Swansea), after Mr. Matterface had delivered his Presidential Address, proposed a hearty vote of thanks to him. He said they had all looked for something interesting and novel from the President, and he had fully satisfied them. He had shown them how thoroughly alive they were in Monmouth to the various kinds of competition that had to be faced, and both Mr. Matterface and the Company were to be congratulated upon the excellent way in which they were managing things for the townspeople. It was very gratifying to note that the consumption of gas in Monmouth, through strenuous efforts, had increased by over 100% during the eighteen years the President had been there. Mr. Matterface and his Directors had brought the undertaking to a highly efficient condition.

Referring to the Address, Mr. Johns said he wondered how it was that it was necessary to scrap meters after fifteen years. He suggested that the Company might consider carrying out repair work by their own staff. Then with regard to the cases in which electric cookers had been installed. He (Mr. Johns) had found it a good idea to provide an iron sheet to go on top of the electric cooker, and then give two gas boiling rings free of charge. The result was that the consumption of gas where electric cookers had been installed was greater to-day than it was before. This was an idea that was well worth taking up.

Mr. W. CLARK JACKSON (Neath) remarked that a great amount of thought had been put into the Address, and therefore he had much pleasure in seconding the vote of thanks to the President. When going over the Works he had been deeply impressed by the orderliness of the whole place. Everything indicated that thought, care, and skill had been put into the development of the Works by the management. Mr. Matterface was on right lines in having developed in such a manner as to be able to give adequate supplies of gas and constant thought to the consumers. The modern showrooms enabled the customer to secure the right type of appliance, and after that the President made sure that the appliance was adequately serviced. This ought to be the outlook of every young man in the Industry. In this way, the Company had proved that even a small undertaking could increase its business in these days of keen competition. If gas was put before the public in the way that this Company had done, progress was bound to result.

The PRESIDENT, in acknowledgment, expressed his indebtedness to the Chairman of the Company for his unfailing support.

The Chairman and Directors of the Company were cordially thanked, on the proposition of Mr. J. E. KENSHOLE (Merthyr), seconded by Mr. I. G. JENKINS (Cardiff), for their kindness in providing a room for the meeting and for their hospitality.

It was left to the Council to decide upon the place of next meeting.

The PRESIDENT said that, before the proceedings closed, he would like to extend a welcome to Mr. W. S. Morland, of Gloucester, whose father was the means of him (the President) being appointed years ago Manager and Secretary of the Cinderford Gas Company. He was a Director of the Company when Mr. Matterface went there. Subsequently Mr. W. S. Morland was elected to succeed his father.

Mr. MORLAND said it was a good many years since Mr. Matterface came into that district. He had been well trained, and had been a success wherever he had been since. His Address had shown him to be a thoroughly practical man. The manager of a small gas undertaking required to be a man of parts, and to have a knowledge of a great many things.

The Countryside.

At luncheon in the Beaufort Arms Hotel over eighty sat down, under the Chairmanship of Mr. Powell, whose Company were part hosts. Mr. Canning, proposing the "Town and Trade of Monmouth," gave an interesting outline of the history and outstanding features of Monmouth. The Mayor, responding, said that, speaking as a sportsman, he could say that he had never met a better sportsman than Mr. Matterface, and he thanked the Association for having elected him their President. The golf cups were then presented by the Chairman, and Mr. Auckland took the opportunity of again thanking the Golf Club and the staff for all they had done to make the visit an enjoyable one. Mr. Morland submitted "The Association," emphasizing the great value of such organizations, and the President replied. It was announced that Mr. Madden, who was away on a cruise, had sent a wireless message conveying his best wishes for a successful meeting.

On the invitation of the President, those present then embarked upon a delightful motor coach trip, covering about 40 miles. The route was chosen to secure some of the most lovely among the many lovely views of the district, and from start to finish it proved a veritable feast of beauty. But business was not altogether neglected, for during the drive a pause was made for inspection of the trim little gas-works. On the return, tea was taken in the Beaufort Arms Hotel as guests of the President, and thus ended what had been from start to finish a completely successful meeting.

Jersey's Splendid Work

Dividend Up—Price of Gas Down

It is indeed gratifying to learn that Jersey, the largest of the Channel Islands, is passing through a very prosperous period, house building operations being very extensive, and the Jersey Gas Light Company's report for the year ended Dec. 31, 1935, shows that the Undertaking is benefiting materially therefrom. New consumers to the number of 580 were connected to the mains during the year, and these in some measure accounted for the additional output of nearly 7 million cu.ft. The Fittings Department was particularly successful having sold or let on hire-purchase nearly 1,200 additional appliances. Sales of residual products were particularly good. A new and up-to-date coke-handling plant as well as a benzole recovery plant have been added during the year.

In a progress table included in this year's accounts it is interesting to note that the past ten years have shown an increase of 34% in the quantity of gas consumed, and 50% in the number of consumers on the Company's books, while cookers in use have increased by 135% in the same period. It is interesting to note that the Company decided to fall into line with the mainland in paying, voluntarily, the extra 1s. per ton on contract coal, towards increased wages for the miners. The Board was, nevertheless, able to announce to the shareholders an increase of 1% in the dividend for the year, with a reduction in the price charged for gas of 0·2d. per therm. The Company is now paying 8% dividend, although entitled on its sliding scale to a 10% division. It has always been the policy of the Directors to keep both capital and dividend low, and the present rate of 8%, costing as it does, only 5d. per 1,000 cu.ft., is ample justification of this policy.

WALES AND MONMOUTHSHIRE ASSOCIATION OF GAS ENGINEERS AND MANAGERS

Presidential Address

OF

H. MATTERFACE, Monmouth

THE PRESIDENT.

Mr. Matterface commenced his work in the Industry over forty years ago with the Bridport Gas Company. Subsequently he was Manager and Secretary of the Cinderford Gas Company. During the eighteen years he has been at Monmouth, the make of gas has more than doubled.

In electing me President of your Association you have conferred on me an honour for which I thank you very sincerely, and as this office has been held by some very well-known and distinguished men in our profession, I trust that during my tenure of office I have not and shall not let the Industry down. It is particularly gratifying, especially when one considers that, even if Monmouth is very ancient and the County town of the "Buffer County" and we have to put up with the kicks of both England and Wales, we still continue to increase our output of gas.

Upon leaving school over 40 years ago I commenced with the Bridport Gas Company, Ltd., to learn gas manufacture and distribution. I well remember people asking my father why he had allowed me to go to the gas-works, as in their view gas would be cut out by electricity in a very short time. I may say that he had some years previously been Secretary to that Gas Company, and in after years was the Auditor. My uncle had also been Secretary and in after years a Director. This may account for my being in the Gas Industry.

Those people were badly mistaken who thought that gas was going out, as during this 40 years or so the output of gas at Bridport has increased some 300% although the population has remained stationary.

When I came to Monmouth some 18 years ago the make of gas was 14 million cu.ft., and now it is well over 30 million cu.ft.; here, again, as in the case of Bridport, the population has not increased. Several times since I have been here friends have asked me what the Company would do when the Town Council put down new electrical plant and extended their mains. Eventually this was done and still we managed to keep going. In 1930 the Corporation sold their electricity undertaking to the General Electricity Company, Ltd. This, again, according to my friends, would put us out of existence, but I am pleased to say that even with this very severe competition we still go on, and the year ended Dec. 31, 1935, broke records as far as output was concerned, for a day, a week, and a year.

In 1918 both direct and regenerative firing were in use, the unaccounted-for gas amounted to 25%, and annual make 14 million cu.ft.; now it is over 30 million cu.ft., and gas unaccounted-for 6%.

In giving these figures, I would like to point out that I do not give them with the intention of casting any disparagement on the previous management; it must be remembered that the Great War was nearly over, very bad times had been passed through, materials could not be easily obtained, labour was scarce, and money in a small undertaking none too plentiful. A very trying period with the mains had been encountered owing to the town having been sewered a few years before, when the gas mains in a number of instances had been suspended with ropes from timbered crosspieces and the sides of the trenches shored up with planks.

The timbering was left in the ground and eventually rotted, and, needless to say, the mains were left in a bad condition. This alone made up a large proportion of the unaccounted-for gas. I would say, in passing, especially to the younger members, that it never pays for a new man to show up his predecessor by pointing out his faults or trying to make a big show over his work in the first few months of coming to a new job, as every man in a like capacity, given the same materials, should be able to obtain much the same results.

The works are situate on the same site as the original works at May Hill, and we are very fortunate to have a railway siding running into them. There are two holders, one having been renewed in my time, and we are now getting to the stage when extra storage will have to be considered. Owing to some of the plant becoming obsolete and because of the increased output several alterations and additions have been made. As regards the buildings, my predecessor had started a type very substantial and pleasing to the eye, and as far as possible the same has been maintained. The largest alteration was made in 1931, when Woodall-Duckham upwardly heated vertical retorts were installed. These have proved very satisfactory.

No doubt some of you are surprised to find such a small undertaking having verticals. The chief reason is floods. In December, 1929, Monmouth experienced the worst flood known, and for three days and nights we had well over two feet of water in the lower part of the works, which includes the old horizontal retort house. By having a barrier consisting of bags of oxide faced up with clay, we were able to keep out most of the water, and what did get into the cellar the local fire engine pumped out. We managed to save the fires from being put out and the retorts damaged, but we were unable to make gas for a few hours owing to the water getting into the exhaust box of the gas engine which drives the exhauster. The supply to the town, however, was maintained. We had to carry coal from the railway trucks in buckets across planks and the coke was drawn out from the retorts on to a platform and carried back to the empty coal trucks, but one of our biggest difficulties was to keep the planks and tubs from floating away.

The results are much better than before we had verticals, especially the quality of the gas and the quality of the coke, but more is used in the producers. More tar is made, and as the output of gas increases our labour cost per ton of coal carbonized will continue to be reduced.

During 1925 and 1926 we put in new condensers, a washer, and a purifier, and built the engine house in which we installed the old exhauster and a new one as a standby, fixing two gas engines and a steam engine for driving them. We have also provided room to put in a boosting plant when this becomes necessary.

In 1928 we rebuilt our works office. The old office was really an old dwelling house, and I believe the late manager was born in the room which was used as a general office. The bottom part is used as a stores and cooker cleaning shop. While this alteration was in progress we

also extended our stores by utilizing some old cottage property adjoining the works.

During 1929 we installed a Parkinson 10 in. governor and relaid the mains in the works.

With regard to the water side of the Undertaking, there is an old Act of Parliament, dated 1818, authorizing the supply of water to the town.

Since I came very little has been altered. We have two pumps which pump water from the River Wye up to the reservoir at May Hill and are only used when our reservoir becomes low. The main supply for the town's need comes from the springs which are situated at Buckholt about two miles away. The reservoir at May Hill is only a service one and acts as a balance, containing about 48 hours' supply, and in conjunction with it there are two slow sand filters.

The Buckholt plant consists of a pressure and a gravity Candy De Clor filter capable of dealing with 500,000 gallons per day; and although there is used some 40 gallons per head daily, we have never been short, and for a number of years have not given notice asking for the use of water to be curtailed, even in dry seasons. The hardness of the water is 8° temporary and 8° permanent, and gas heated water apparatus is not unduly affected. The price of water is very reasonable, and to the Corporation, at 6d. per 1,000 gallons, is below the cost of pumping. In two gas concerns in which I am interested and where the water belongs to the public authority, we have to pay something like 2s. per 1,000 gallons, so it appears by this that a company can manage its water undertaking better than a public authority.

For a small place, gas and water work very well together; often the laying of both mains and services can be done in one trench, saving considerable expense.

The works at May Hill date back, as far as I can find out, to before 1829, and I am sure that a number of the mains which would date back nearly to that period have been relaid during my time. The mains from the works pass under the railway line and then over the River Wye Bridge and thence to the town, where they go out some 1½ miles from the centre in five directions. In the last 18 years nearly all the mains have been relaid and enlarged, both gas and water; fortunately for us, we have no collieries to cause us worries, as a number of you have.

Stop Taps for Services.

The services have had a great deal of attention. We have weeded out small sizes and put in larger, in most cases a service of not less than 1 in. diameter. The possibility of increasing our customers' consumption is always before us, and I personally believe in the practice of trying to increase an existing customer's consumption in preference to putting on a new consumer. For all large services I am now fixing a stop tap outside in front of the house in the same manner as is done with water services, and I think it would be to our advantage if all services were thus tapped, even the smaller ones. Leakages from broken mains or services, especially during the frosty season, would be easier to trace, as the gas would have a tendency to come up at the box covering the stop tap. I know there are disadvantages to this practice, but I feel sure the good points outweigh the bad.

The meters, too, have been dealt with, and we have now very few in use more than 15 years old. We never have a meter repaired that is more than 10 years of age; it pays better to buy new ones, as the cost of repairs sometimes comes very near to the price of a new meter. The advent of the Duplex type of prepayment meter was of special interest to the smaller undertakings. It was the means of cutting down prepayment meter stock by half.

The present price of gas is 4s. per 1,000 cu.ft., or 9·6d. per therm, and we give discounts according to consumption which vary from 2½% to 15%. Since the Industrial Centre at Cardiff started, of which I am pleased to say we are members, we have allowed special discounts to consumers using gas for any industrial purpose, such as laundries, bakeries, and gas engines, ranging from 25% to 37½% according to consumption.

With regard to appliances, we hire out any, but we have found that consumers, if given a keen figure for hire purchase, will prefer paying for it by this method. In the past we have purchased packed cookers, black body with white door, for simple hire and slot installations, but recently we have put out single cased all enamelled cookers for this purpose, as in many small houses the oven is only used, say, once a week.

Prior to 1926 all the fitting work was done by local tradesmen, as there was not sufficient work to warrant employing our own fitters; but from that date we commenced to canvass our consumers with a view to getting them to install up-to-date appliances. As very few of them had had the opportunity of seeing anything new, we had therefore to install the appliance they required on trial, and I am glad to say that this method was successful. From 1926, when we started with our own staff of fitters, work has gradually increased, and we now have to employ the local tradesmen to help us.

In 1930 we opened a showroom and office in the town, and this may account for our further increased business. I have often heard directors ask if a showroom pays, and I always answer "Who wants it to?"—one may as well ask does the gasholder pay.

Free Maintenance.

We also give our consumers the service of free maintenance, outside lamps are cleaned once a week, any consumer's fittings or appliances are cleaned free of charge, and damaged or broken fittings replaced at about cost price. Water heaters are also overhauled, the instantaneous type two or three times a year and the storage type at least once a year. This work we find comes very expensive to a small undertaking such as this, but we must do it to be able to give our consumers satisfaction and keep the appliance in working order. We have over 100 multipoint instantaneous water heaters fixed, and have had considerable trouble with the coils, which are expensive to replace, and I am of the opinion that it is better to push a slow storage water heater in preference to the instantaneous type. Our results with the present make of flueless heaters have been very satisfactory, and we have found some of them quite up to the makers' claims if cleaned at least once a year.

Some two or three years ago we commenced putting out wash-boilers on simple hire, and a very large proportion of our consumers have taken advantage of this.

We have recently fixed up a fish fryer, gas engines have been installed, and we have just supplied our largest bakery establishment with a Cox "Heat Trap" oven. The only two laundries we have here use nothing but gas for lighting and high-pressure gas for ironing. I fully agree with the statement which has been made in our Press that the makers of gas engines have not improved on the old-fashioned engine as they could have done, and we should be able to cut out all petrol engines.

As regards lighting, my advice is, on no account let the lighting load go. Gas is still the best means of lighting for the people with limited incomes. It gives light with heat and rarely lets them down, it is healthier than any light without heat, and blackened ceilings are better than having blackened lungs. All people who think must know that it is not the gas but the charred dust, which, drawn towards the burner and rises to the ceiling, causes the discoloration. I cannot say definitely, but I am fairly safe in saying that our lighting load amounts to over 25% of our output and in recent years has increased. I am proud to have in my possession an agreement made between our parish churchwardens and this Undertaking for the lighting of the parish church of St. Mary's, and also St. Thomas' Church, dated July 31, 1836, and one of the conditions is as follows: "That if from any accident which may happen to the gas-works or to the pipes or apparatus or cause arise, to light the same churches or either of them with candles, to deduct the expense of so doing from the next yearly payment." The charge for lighting was based, as was customary then, on hourly lighting, and I am glad to say that after 100 years these churches are still lit by gas. I wonder if when electricity fails the same conditions apply as it did in this case, especially with public lighting contracts.

Switches for lights and fires have been fixed in a number of houses and have proved very satisfactory.

In a small concern such as ours it is necessary for all employees to act as salesmen, but as the job is a very difficult one it does require in larger concerns specially trained men, and the salesman must be made one of the chief officials.

We have been told to stimulate interest in our Industry and maintain the personal touch by getting members of the staff to sit on various committees, such as clubs, chambers of trade, societies, schools and churches, and if possible on councils or make personal friends of members of such bodies; but in Monmouth we have found that this method does not recommend itself—in fact, in one or two instances the direct opposite to that anticipated has been the result. But I advise all of you to allow as many of your employees as possible to join local ambulance classes; it is a no-pay job, and I am surprised to see how well it is run and the good it does.

Gas on Housing Estates.

Some public bodies have installed, and are still installing—as is the case at Monmouth—electricity for lighting in preference to gas in their housing schemes, without con-

sidering the installation cost to the ratepayer and the after-charges to their likely tenants. Monmouth has three housing schemes. The first had gas for lighting, cooking, and some water heating. In the second both gas and electricity were installed for lighting and gas for cooking; in the third, electricity was installed for lighting and gas for cooking and water heating. After a period some tenants in the first scheme wanted electricity for wireless sets, and it was installed; in the second scheme, many more tenants used gas for lighting; and in the third, while we offered to install gas for lighting free of charge, yet the Corporation paid something like £123 to put electricity in, and when some of the houses became occupied many of the tenants required gas. The Corporation went so far as to say that the tenants could not have it, although we had previously done our best to publish the Gas Undertakings Act, 1934, and educate them in this matter. Needless to say, we have started to put in gas lighting in sixteen out of the twenty-four houses canvassed, but, as you know, this will cost us much more now than it would have before the boards were laid. I am pleased to say that some of the tenants in the first Housing Scheme who had electricity put in have gone back to gas lighting.

I personally fail to see why the Corporation should put in electricity in this type of house, as the only point where gas does not equal electricity is when a person has lost the smelling sense, as gas in all other respects is safer and better.

Even shareholders do not make a salesman's job easy. We find that some will not have cookers fixed as we suggest, and then complain that it is the gas that causes the colouring to come off the walls and ceilings. If any type of cooker, gas, oil, or electricial, is fixed in a room without means of taking off the steam from boiling water, &c., the decorations are bound to suffer. The best and only sane way is to put the appliance under the chimney where the old coal range was fixed and nicely tile it round.

Again, some will not spend 2s. 3d. on a proper bracket with flex tube attachment; they prefer taking off the swan neck of a bijou burner, and I know of one lady shareholder putting in electricity and having no gas at all, and only a garden tap for water. If I had my way I would forget to send her dividends. I often think that Chairmen at Annual Shareholders' Meetings could point out to the shareholders the necessity of all doing their part in pushing gas. It is difficult for the Manager to do this, even if he is given the chance.

It is up to us to fight the electrical industry in every way possible. They are not particular what they show in their picture advertisements. Watch public authorities with their housing schemes, for lighting and cooking, and do not agree to halve the business with the electrical undertaking, because the tenants, as we all know, can demand which they prefer. The biggest asset to the electrical industry is the ordinary householder wanting an all-mains wireless set; this has lost us more custom than anything else.

Many persons are members of the Electrical Institution, who deal with anything electrical, and I know of instances where sales of gas apparatus would have been lost unless the customer in question had looked into the matter and demanded gas. Some bakers' equipment suppliers, cinema engineers, Post Office officials, and many others are members of the Institution of Electrical Engineers, and it seems very rare to find a member of The Institution of Gas Engineers. While I know we lose business by being such a reserved Institution and our sales suffer, yet it appears very difficult to alter it.

The Gas Industry should be proud of its meters, which are often in use for 30 years and still pass the Board of Trade test, and for which we pay something like £50,000 per annum for stamping fees. Why should not the electrical meters have to pass a similar test?

Coke Oven Gas.

As regards coke ovens, in my opinion they should come under the gas engineers' control. It appears to be becoming general for the Gas Industry to take their surplus gas, and as our great motto is "Continuous Supply," to uphold this the gas undertakings will have to keep their plant in working order, up-to-date, and be ready to start up at very short notice. We rarely hear of strikes in gas-works, but we cannot say the same for the collieries.

It is better for the prospective gas engineers to be trained in a gas-works rather than come into the profession from outside, and the training and the schools should be in accordance with the National Gas Council's recommendations.

Before I close I must say how much advertising has helped the Industry. The pamphlets, displays, and propaganda supplied by the B.C.G.A. have proved a boon in more ways than one, and I think it is essential that every undertaking should help this Association by subscribing their full quota to enable them to carry on the good work they are doing, improve it where and when they can, thereby assisting us who may not be experts in this kind of work to bring more forcibly before the public the uses of gas. Some of us may not always see eye to eye with them, we may not agree with all the things they say or do, but we must remember that they have the whole of the Industry to consider, and what would suit one would not suit another.

The best form of advertising that suits here is to advertise chiefly in the local Press. We have a space each week in this, and not only do we use it for ordinary advertisements, but we re-print anything appertaining to gas matters which are published in the daily Press. This is done with the idea of educating the public and making them gas-minded—for instance, street lighting and other contracts obtained by gas undertakings, and public enquiries, such as the Winsford Order Enquiry, when the electricity company opposed the extension of gas mains, with the idea of preventing competition. The gratitude of the Industry is due to companies like the Newport (Mon.) Gas Company, the Gas Light and Coke Company, the York Gas Company, and others, who have taken Bills to Parliament to obtain their rights and ours.

In conclusion, I must say something about large finance corporations controlling gas companies. We in our Association have often in the past been advised by Mr. Madden of the necessity of combining together in some way, and I am sorry to say that this advice, for various reasons, has not been taken advantage of. Now, owing to money being so cheap, the same result is being brought about, but not quite as well as could have been done by a combination.

There are many advantages in being part of a large concern, such as pension schemes for all, purchasing at lower prices, the use of trained canvassers and showroom window dressers. On the other hand, the old gas engineer who looks on the gas-works as his own and works it as such does not take well to the new order of things, and, sad to say, as time goes on, it means less employment for someone. To me it appears that it is better when public utility undertakings are in the hands of a Company and are strictly controlled by Act of Parliament as to the prices to charge and the dividends to pay, thereby satisfying the public with whom we deal.

Home Service Bureau at Dudley

Inaugurated by the Mayoress

A Home Service Bureau installed at the Dudley, Brierley Hill, and District Gas Company's offices, 70, High Street, Dudley, was declared open by the Mayoress of Dudley (Mrs. J. L. Hillman) at the Company's lecture room on Thursday, May 14, when an interesting demonstration of cookery, one of a series to be held every week, was given by Miss D. Challens, Diplomée, N.T.S.C., who will have future charge of the bureau.

There was an excellent attendance at the inaugural demonstration, when reference was made to the increasing number of new labour-saving devices, utilizing gas, of which the general public were unaware.

The opening ceremony was presided over by Mr. F. C. Briggs, Managing Director of the Dudley, Brierley Hill, and District Gas Company, who introduced the Mayoress to the audience.

Mr. Briggs, in calling upon the Mayoress to declare open the first of the series of demonstrations, said that comparatively few people really knew about the labour-saving gas devices, and the Gas Company thought that this was their (the Company's) fault. They had, therefore, endeavoured to rectify that fault, and to bring before housewives the various new uses of gas. The Mayoress said she was very keen to come to these demonstrations whenever possible. There was always room for learning in the art of cookery as in any other sphere of activity, and they could obtain many useful hints. She had taken a special liking to the "New World" cooker, and was hoping to pick up some useful hints from Miss Challens.

Miss Challens presented the Mayoress with a bouquet of pink roses on behalf of the Gas Company, and proceeded to give an interesting demonstration of cooking various dishes.

YORKSHIRE INDUSTRIAL GAS DEVELOPMENT CENTRE

MAINTENANCE AND TESTING OF Gas-Fired Water Heaters

by
W. L. HOWE,
Industrial Development Engineer, Nottingham Gas Department

From a Paper read before members of the Yorkshire, Industrial Gas Development Centre at Leeds.

As a selling point, the trouble-free characteristic of gas-fired boilers is an important one, and although this Paper is in part devoted to complaints, I would say at the outset that our experience in Nottingham with something over 200 boilers endorses the makers' claims regarding freedom from trouble. In those cases where complaints are made of the operation of boilers it has been found that almost all fall under three main causes:

(*a*) Faulty installation in the first case, by heating engineer or plumber.

(*b*) Lack of knowledge by the owner.

(*c*) Complete lack of attention to cleaning, &c.

Such complaints as do occur can generally be rectified in a matter of minutes provided a methodical investigation is made on arrival at the site.

The owner or attendant will generally furnish one with a description of the "symptoms" from which a diagnosis can be made. Obviously it is to our advantage if a speedy cure is found, indicating not so much our knowledge of the boiler as its own extreme simplicity.

The following are a few cases which we have been called to in Nottingham; and while most are obvious, others may be interesting and, I hope, helpful, should similar circumstances arise in any of the areas here represented.

Ideal Boilers.

1. *Complaint*—Drop in speed of heating and smell. The "smell" immediately leads one to investigate combustion, and in the case in question this was found to be very poor. Application of a match or taper held at the lighting hole and at the baffler showed a continuous outflow of products. The boiler was clean. The flue, although tortuous, did not contain any condensate traps, and the outlet was well clear of static pressure. This led one to pre-suppose blockage of the flue; and stripping of this at a bend revealed almost complete stoppage by a crystalline substance which was easily removed. This deposit was probably a sulphate compound between dilute H_2SO_4 and the bonding constituent of the asbestos flue.

2. *Complaint*—Boiler remains at "low." Having ascertained that the amount of gas passing was the minimum or by-pass setting, and not something intermediate, we were led to investigate the control equipment. Any stoppage in this line would, of course, have kept the boiler "off." The fault was finally traced to the clock control in which the plug had stuck in the closed position, although the clock mechanism continued to work. In a similar case the consumer had omitted to wind the clock, which had stopped in the "off" position.

3. *Complaint*—Explosion. The simplest and most obvious causes are very often the most difficult to locate; and here is a case in point. The boiler casing had been badly buckled and was beyond repair. An examination of the brick stack and enquiries elucidated the fact that this was completely tiled over at the top, provision for exit of the gases being only four small air grates let into the sides. Our assumption was that this area was insufficient and that flue gases had put out the burners, which had then filled the boiler with raw gas. The insertion of a lighted taper by the caretaker would then have caused the explosion. A new casing was fitted, and at the starting up the Department and the boiler makers were represented. It was then found that when the thermostat operated the burners were completely out, and it was found impossible to keep any pilot light in. A careful investigation showed that the gas governor had been fitted by the heating engineer the reverse way round. The diaphragm had then been heavily weighted in order to keep the valve open when the gas was full on. When the boiler should have been on pilot, however, the pressure had completely closed the governor.

I may say that this is the only case resulting in an explosion, but we have had one or two cases where ignorance on the part of the plumber has caused us trouble.

Vesta Boilers.

4. *Complaint*—Thermostat very slow in action causing large flame on top of boiler when shutting off. Had the thermostat been slow in bringing the gas on, a leaking or punctured leather diaphragm might have been suspected. The symptoms, however, showed that it was slow both "on" and "off." The valve spindle was found to be quite free, suggesting that the necessary force to raise the valve was lacking. Examination of the suction pipe to the leather diaphragm showed that this was blocked by rust particles. Cleaning the pipe immediately remedied the complaint.

Flues.

No list of possible sources of trouble would be complete without a few notes on flues. It is advisable in every case to fit either a separate flue of acid-proof asbestos or other suitable material or to provide a brick stack lined with glazed sewer pipe.

So much trouble and expense has been incurred through inefficient flues fitted by persons ignorant of the effects of condensation that we are now always particular to advise the above precautions. In every case provision should also be made for the collection and disposal of condensate.

The best flue is undoubtedly a brick stack lined with glazed sewer pipe, the joints being made with lead wool topped with cement. An excellent second choice is an asbestos flue painted inside with some acid-resisting paint such as "Keragel," and joints made as above. This acid-resisting paint with which we have lately been experimenting seems to open up some helpful possibilities.

The Consumers' Gas Company of Toronto now use a somewhat similar compound—namely, asphalt chromate—with which to spray the inside of existing brick chimneys to make them impervious to the action of condensate. The equipment necessary for this operation, however, appears to be somewhat awkward to handle, and the operation itself a very "messy" one. We have therefore decided on the policy of separate flues, unless the consumer is prepared to risk the consequences of exhausting into a brick chimney after having been warned.

In cases where an existing brick stack has been used an opening has been made in the base in order that the admission of air might lower the dew point of the mixture of products and air. This is not a sure cure, as we have proved to our satisfaction (or otherwise!), but certainly assists where condensation is only slight.

In my opinion the provision of an adequate and efficient flue is of major importance on any boiler plant, and too much careful consideration cannot be given to its position and construction.

Standard Conditions of Test.

While the industrial salesman has available a wide selection of gas-fired boilers from which to choose, if he were to base his choice solely upon the statements of efficiency made in catalogues he would undoubtedly be at times doomed to disappointment.

In the writer's opinion very few boilers maintain on site the efficiencies claimed for them by their makers, for which state of affairs there are several reasons.

A flat statement of a certain efficiency is useless without an accompanying account of the conditions under which the test was conducted and whether the calorific value of the gas used was based on the net or gross figure.

Similarly, the majority of water heaters are tested by running through a quantity of cold water, heating to, say, 180° F. and calculating from the temperature rise, quan-

tity of water heated and gas consumption, the output and efficiency of the boiler.

If this particular boiler is to be used for central heating where the difference between flow and return is only some 20° F., it is obvious that the heat transmission through the sections will be something less than under the conditions of the test, and the efficiency will be correspondingly lower.

The Industrial Centres would be performing a useful service in drawing up standard forms of test for boilers for different classes of work so that a real value could be ascribed to the efficiency of any boiler under certain conditions.

It is the tendency of some heating engineers, while allowing a large margin on a solid fuel-fired boiler over the heating requirements, to install a gas-fired boiler of only a little more than the required output, and if this margin is still further reduced by an efficiency which is lower than that stated, nothing is left in hand for severe weather conditions, with consequent complaints of inadequate heating, such as some of us had during the past winter.

Cirencester Gas Bill

House of Commons Committee

(*Before Sir* RICHARD MELLER (*Chairman*), *Captain* O. PEAKE, *Mr.* F. B. SIMPSON, *and Mr.* LOVAT-FRASER.)

The purpose of the Bill is to dissolve the existing Cirencester Gas Company, Ltd., and to incorporate the Company as a statutory undertaking, to increase the capital, to apply the basic price and basic dividend principle, and to confer the powers usually given to a statutory company, including power to institute profit-sharing.

The Company was represented by Mr. Harold W. Beveridge.

The only opposition was that of the Conservators of the River Thames, as the Catchment Board for the Thames Drainage Area. The Board did not oppose the preamble of the Bill, but asked for a clause that if pipes or other works of the Company were to be constructed across the river Churn, notice should be given to the Board's Engineer, whose consent should be necessary as to the position of the works. The Board was represented by Mr. F. J. Wrottesley, K.C., and Mr. F. W. Wallace.

Mr. BEVERIDGE, for the Company, said that no report had been submitted by the Board of Trade in regard to the Bill, the reason being that the Company's financial advisers had been in consultation with the Board concerning the financial provisions of the Bill. The full figures had been before the Board and had been approved, after certain amendments and additions.

The total capital to be authorized under the Bill was £50,000, of which £47,148 would be called the existing capital and would be issued in substitution for the existing shares of the Limited Company, the remaining £2,852 being the additional capital. The whole of the capital would be 5% basic dividend stock. The £47,148 would be issued in place of the existing 10, 5, and 7% shares. The total borrowing powers would be £25,000—i.e., there would be power to borrow up to 50% of the amount of the issued capital. The amount borrowed already was £6,500. Thus, the total unissued powers would be £2,852 share capital and £18,500 loan capital, a total of £21,352. In view of the developments in the Gas Industry, that could not be regarded as an excessive figure, said Counsel.

Mr. *A. W. White*, F.C.A. (Partner in Messrs. Cash, Stone, & Co., Chartered Accountants, who advised the Board of Trade Committee on Gas Legislation), gave evidence. As adviser to the Cirencester Company, he said, he had thought it would be a good thing, both for the Company and for the consumers, if the Company were modernized completely and made a statutory undertaking. The capital of the Cirencester Company at present was in very small groups; the smaller the groups of capital, the less marketable they were, and it would be of advantage to the Company and the shareholders to consolidate the capital into one group and improve its marketability. That also would assist future issues.

Discussing his consultations with representatives of the Board of Trade on behalf of the Company, he said the most important alteration made to the original proposals of the Bill was the reduction of the basic price. Largely it was a matter of difference between the Board of Trade and himself as to the amounts to be set aside by the Company for reserves; he had wanted to allow more than the Board of Trade had thought desirable, and it was agreed to alter the basic price. The principal objection made by the Board related to the allowances made for repairs in his calculation of the basic price, those allowances being based on the experience of the last few years. The Board had held the view that inasmuch as they were the full allowances for a normal year's repairs, if they were included in the calculation there was no need to include also the full allowances he had included for special purposes and renewals funds. After much discussion, the Board was satisfied with a basic price of 11·4d. per therm, and he had advised the Company to amend the Bill accordingly.

It was usual to allow gas companies sufficient capital powers to enable them to carry on for 15 years without coming back to Parliament or to the Board of Trade. The existing limited liability company had unissued capital powers to the extent of £14,000, which were being repealed, so that in asking for capital powers which left £21,000 unissued, the Company was asking for only an additional £7,000. The Board of Trade was quite satisfied with that.

Mr. White produced a table showing the details of the calculation of the basic price, and another summarizing the revenue and net revenue accounts for the five years ended June, 1935. The latter indicated the progressive growth of the undertaking, the gradual reduction of the price of gas and increase of total receipts. The table also showed that in each of the last five years, except 1933, there had been a surplus; in 1933 there was a deficit of £3,600, due to transferring £5,000 to reserve fund in that year. Throughout those years the Company had more than earned its dividend.

Mr. R. J. MULLINGS (Chairman of the Company) proved the preamble of the Bill.

(The Committee found the preamble of the Bill proved.)

Mr. BEVERIDGE, referring to the petition of the Conservators of the River Thames, said it drew attention to a clause in the Bill, giving the Company power to lay pipes and culverts, and applying the provisions of the Gasworks (Clauses) Act, 1847, with respect to the breaking up of streets, provided that no such pipes or culverts should be laid without the consent of the persons having the control or management of the streets. Counsel could not see how the provision of such pipes would interfere with the river. It was stated in the petition that the Company would be able to lay pipes in, under, or across the river Churn, but the Bill did not give powers to do that, though the Company could carry mains across the river on a bridge, under the provisions of the Gasworks (Clauses) Act, and in any case the Company had no intention of laying mains in or under any river. The petitioners asked that any work affecting the main river should be carried out only with their approval. The Conservators wanted to be in a position to say that the Company should not lay a pipe across the river at any time in the future, even if it wanted to do so. He opposed that contention strenuously.

Mr. F. W. WALLACE (for the Conservators of the River Thames) said he was asking merely for some regulative provision to enable the Conservators to carry out their duties; it was desired that the Company should be under a statutory obligation to consult with the Conservators' Engineer in order that such works as the Company proposed would not cause harm to the river. In other words, the experience of the Conservators' Engineer should be brought in to assist. A clause on such lines, he said, for the protection of the Great Western Railway Company, was already included in the Bill. He submitted a clause which it was suggested should be inserted in the Bill.

Mr. *John Griffiths*, M.Inst.C.E. (Chief Engineer to the Conservators of the Thames), gave evidence. He said that the Board was responsible for 688 miles of main river, including the Thames above Teddington, and possibly in the near future it would have jurisdiction over 1,205 miles, depending on an application to be made to the Minister of Agriculture and Fisheries. In some places he had experienced trouble due to pipes going across the river, sometimes in a haphazard way, and in one case it had cost the Board £1,000 to put matters right. He had had to remove some pipes and had had to leave others because the cost of dealing with them would be almost prohibitive; they were mostly sewers and water mains, and there were not many gas mains giving trouble. In a number of cases those who had wished to lay pipes had asked the Board the levels at which the pipes should be carried, and so on, so that trouble was avoided. He did not wish to be obstructive; indeed, he could be very helpful, because he could tell those who desired to lay pipes the troubles that were likely to arise if the pipes were placed at the wrong levels.

Mr. BEVERIDGE, cross-examining, said the petitioners were trying to create a precedent in entirely unjustifiable circumstances.

Mr. *Griffiths* disagreed.

Mr. BEVERIDGE suggested that if Parliament had intended to give special protection to the Board in respect of the laying of gas pipes, it would have given that protection in the Land Drainage Act of 1930.

Mr. *Griffiths* suggested that probably Parliament had not been aware of experiences such as he had had during the last few years.

Mr. BEVERIDGE pointed out that if the Company wished to lay a pipe in the roadway of a bridge across the river it had to give notice to the Gloucestershire County Council; if it had also

to give notice to the Conservators, and the two disagreed, the Company would be in difficulty.

Mr. *Griffiths* said he was not very interested in the laying of a pipe in a roadway of a bridge. If the County Council allowed the Company to sling a pipe underneath a bridge, then he was concerned.

Mr. WALLACE said he did not wish to bind the Company to the particular wording of the proposed clause, but he asked the Committee to agree to the insertion of a clause which would ensure consultation and co-operation between the Company and the Board, so that the experience of the Board could be brought to bear, to the advantage of all.

In reply to the Chairman, Mr. Wallace said that the Gloucestershire County Council nominated one member of the Board.

After the Committee had deliberated in private,

The CHAIRMAN said the Committee felt that the Thames Conservancy were entitled to a protective clause, providing for notice to be given of the construction of new works, the laying, repairing, altering, or enlarging of the Company's mains, pipes, or other works across the main river, so that there should be opportunity for consultation with the Engineer in regard to such works; if there were disagreement as to the work to be undertaken, the matter should be referred to an arbitrator appointed by the President of the Institution of Civil Engineers.

Mr. BEVERIDGE said he did not think the Board had even asked that the clause should apply to the alteration or repair of existing works, but only to new works.

The CHAIRMAN said there was a possibility of alteration of existing works so that they might be placed in a position in which they would be likely to impede the flow of the river. Existing works would then be made, in effect, new works. He asked the parties to submit a clause giving effect to the Committee's views.

Coin Change Device

The "Newco" Demonstrated

We had demonstrated to us recently by the inventor, Mr. R. J. Baker, 13, Warwick Road, Ealing Common, W. 5, a device—the "Newco"—for fitting in the coin box of a prepayment meter enabling change for a larger coin to be given. It is of simple construction. The pennies, as they drop from the coin mechanism, are stacked in a tube, and when this is full they are deflected straight into the coin till proper. When coins in excess of twelve have accumulated in the tube, a slot in the front of the till is uncovered. This allows a shilling to be inserted and a drawer pulled out to give the necessary change. The locking mechanism consists of a catch released by the weight of a shilling on a balanced lever.

In effect the device provides the meter with a two-coin mechanism while the obtaining of change has an added attraction to the consumer. It is argued that many consumers do not care to insert so large a coin as a shilling in the meter at one time and, if the consumer has no smaller coin than a shilling, he is able to obtain the necessary change and insert as little as a penny. To the gas undertaking it means that meters need not be cleared so often.

Measurement of Nitric Oxide

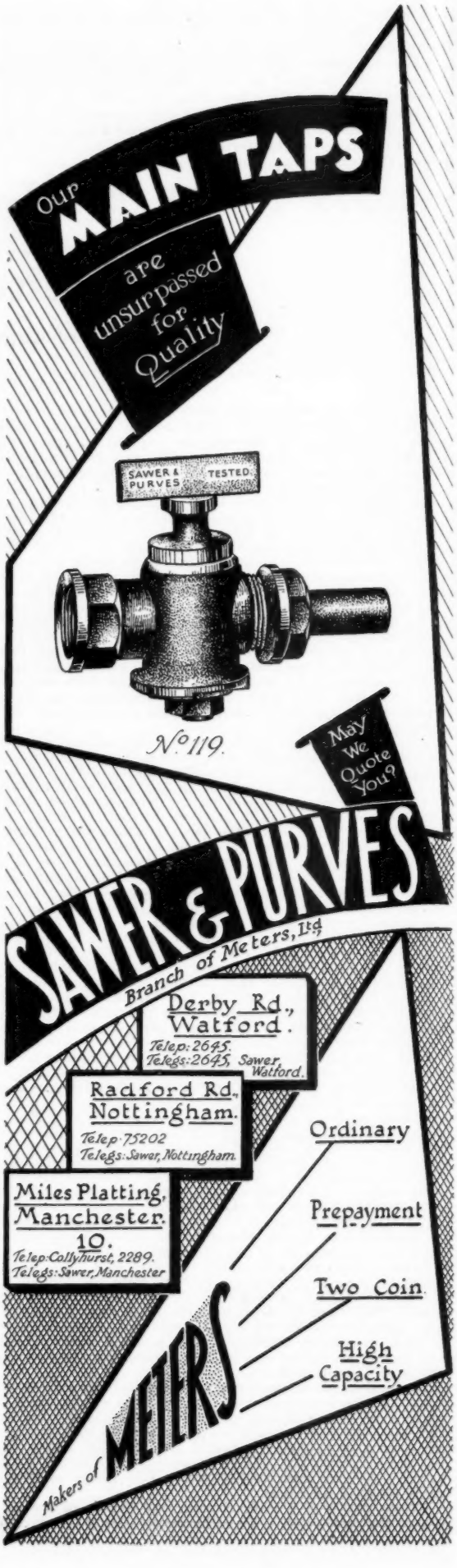
Key Industry Duty

A representation has been made to the Board of Trade under Section 10 (5) of the Finance Act, 1926, regarding the following:

Gas analysis apparatus combined with a bridge potentiometer, adapted for the estimation and continuous record of nitric oxide in gases, wherein the nitric oxide is absorbed in a suitable liquid, the depth of colour generated therein being measured photo-electrically.

Section 10 (5) of the Finance Act, 1926, is as follows: "The Treasury may by order exempt from the duty imposed by Section 1 of the Safeguarding of Industries Act, 1921, as amended by this Act, for such period as may be specified in the order, any article in respect of which the Board of Trade are satisfied on a representation made by a consumer of that article that the article is not made in any part of His Majesty's Dominions in quantities which are substantial having regard to the consumption of that article for the time being in the United Kingdom, and that there is no reasonable probability that the article will within a reasonable period be made in His Majesty's Dominions in such substantial quantities."

Any communications should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, S.W. 1, within one month from May 20.



The York Gas Bill

House of Commons Committee

(*Before Sir* RICHARD MELLER (*Chairman*), *Captain* O. PEAKE, *Mr.* F. B. SIMPSON, *and Mr.* LOVAT FRASER.)

(*Concluded from p. 535 of last week's issue.*)

Mr. NEEP, addressing the Committee on behalf of the Corporation, said the onus was upon the Gas Company to satisfy the Committee of the justice of their demands. Between 1920 and 1922 the Gas Company had asked that the Corporation should pay a sum of money in respect of each house to which gas was supplied; at different times thereafter their offers to supply gas had taken the form of a demand that a certain sum should be paid for each house piped or for the use of apparatus. It was not unreasonable, therefore, that the Corporation, in their desire to keep down the costs of the houses, should decide on all-electric houses. It was not until November, 1935, that a clear and definite offer was made by the Gas Company to carcass, free of cost to the Corporation, the houses to be built in the future. It was somewhat instructive that the Gas Company had recently provided six houses for their employees and had fitted those houses for the use of gas only; they had not provided facilities for electric lighting. It would seem, therefore, that the Company would not give in those houses the freedom of choice which they were trying to impose upon the Corporation. The Company were asking Parliament for such powers as would give them a kind of paradise, but which had no relation at all to the facts existing in the area under consideration. Not one witness on behalf of the Gas Company had expressed a preference for gas lighting; the Company were opening their mouths as wide as possible to collect every possible power they could induce the Committee to give.

Mr. TYLDESLEY JONES (for the Company) remarked that it was a little sad that the Corporation should be spending the ratepayers' money, to which the gas consumers had to contribute, in bringing forward such a poor case. It had been proved by Councillor Mrs. Crichton herself that the Company's case was right, since she had admitted that the tenants of the Corporation's houses had no freedom of choice.

Dealing with the criticism that the terms of the Bill might give the Gas Company power to carcass the Town Hall or the public baths or other such buildings, Counsel said he was willing to limit the premises to which the Bill applied to "a dwelling house, block of flats, or shop." But if hereafter the Company found that the Corporation were placing obstacles in the way of a supply of gas to any other class of building, they would not hesitate to promote further legislation.

Carcassing during Alteration.

The CHAIRMAN, referring to the provision that the Company would have power to give notice to carcass a whole building if part of it were in process of alteration, said that if a brick had to be knocked out, or if a side door were put in, it would not really involve alteration of the building, but it might give the Company power to carcass the whole building.

Mr. TYLDESLEY JONES said the difficulty was that if an old cottage, for example, had no sanitary accommodation and was not fit for habitation, and if the Corporation added to it that which rendered it habitable, the Company ought to have the right to carcass the whole house and not merely the addition. It could not be regarded as reasonable that the power to carcass should be limited to the part of the house which was being altered, because an alteration to a small part of the house might render the whole building habitable whereas it was not habitable before.

Captain PEAKE said the carcassing of an existing building might put the tenant to considerable inconvenience and expense in re-decoration. To give the Company the statutory right to carcass the whole house because a minor alteration was made to a part of it might be unreasonable.

Mr. TYLDESLEY JONES replied that the Company did not want unreasonable powers. Another difficulty, however, was that if one flat had to be carcassed in a large house which had been converted into flats, it would be necessary to carry the pipes through the part of the building which had not been altered, and which the Company could not claim to carcass if they were limited to carcassing only the altered parts of a building.

Asked whether a question of that sort was one to be considered by the Magistrates in case of dispute, under the terms of the Bill, Counsel said he did not think it was. The Magistrates would have to decide whether the facilities for which they asked, in order to do what they were entitled to do, were reasonable. The question as to whether the Company should carcass only the altered part of a house or the whole of it was a matter for the Committee to decide.

(The Committee conferred, and decided that the preamble of the Bill had been proved.)

A discussion followed with regard to clauses.

Mr. NEEP submitted that, inasmuch as no evidence had been put forward in regard to shops, the provisions of the Bill should be limited to houses and flats; if in future the Company had evidence with regard to shops, they would be entitled to promote another Bill.

Mr. TYLDESLEY JONES objected, pointing out that that matter was considered in connection with the Gas Light and Coke Company's Act in 1933; in that Act, and in the Gas Undertakings Act of 1934, Parliament had decided not to limit the principle to shops.

The CHAIRMAN pointed out that the tenant of a dwelling attached to a shop might reasonably ask for freedom of choice.

It was urged by Mr. Neep that the provisions of the Bill should not extend to the carcassing of houses for gas lighting. The Chairman pointed out, however, that the houses would be required for many years to come, and there should not be a limitation. The Bill must relate even to gas lighting if it should be required.

Captain PEAKE said that, because the Company had power to carcass for lighting, it did not follow that they would provide such carcassing; it could not be in their interests to waste the money of their shareholders.

Mr. NEEP pointed out that, as a result of canvassing, the Company might induce some unfortunate women to try gas lighting.

Captain PEAKE replied that, if it were a failure after it had been installed, the Gas Company would then have wasted their money. It must be assumed that the Company would exercise their powers in their own interests at any rate.

(After further discussion, the clauses were altered to restrict the powers of the Bill to houses, blocks of flats, and shops, and to provide that where any of these buildings were undergoing "alteration," the power to carcass should apply only to the part altered; the latter limitation did not apply to cases of erection, re-erection, and conversion.)

The Gas Light and Coke Company (No. 2) Bill

The Bill promoted by the Gas Light and Coke Company, to compel local authorities owning electricity undertakings to give the Company facilities to pipe municipal houses, &c., at the time of their construction, is again before a House of Commons Committee, and the evidence for and against it is being heard again. Already the Bill has been considered by a previous Committee of the House, but after the case for the Company and some evidence on behalf of the opponents had been heard, a decision was given, as the result of a misunderstanding, before Counsel for the opponents had addressed the Committee. (See "JOURNAL" for May 13, p. 409.)

Consequently, the Bill was re-committed, and the proceedings opened again on Thursday, May 21, before a newly-appointed Committee consisting of Sir John Ganzoni (Chairman), Mr. Brocklebank, Mr. Ben Smith, and Colonel Sandeman Allen. The local authorities which opposed originally were again represented.

Some amendments have been made to the Bill since it was promoted. During the previous proceedings the Company offered to limit the "fittings" which the Bill empowered them to provide to include only the joints, angles, clamps, connections, and other like things used in providing, laying, placing, and fixing pipes. The Bill has been amended accordingly. There is also an amendment to the effect that where a building is in process of alteration the power to claim facilities for piping is to be limited to the altered part. A third limitation is that the powers of the Bill shall apply only to dwelling houses, blocks of flats, or shops, whereas previously it was asked that they should apply to buildings of any description. It was argued during the previous proceedings that the Bill, if passed in the form in which it was promoted, would enable the Company to claim the right to carcass, for example, a town hall, a park pavilion, public baths, and even electricity showrooms [and, incidentally, Sir David Milne-Watson remarked jocularly in the course of his evidence then that the carcassing of the latter might be a good thing). The limitation to dwelling houses, blocks of flats, or shops, it will be remembered, was accepted by the York Gas Company in a similar Bill, the preamble of which was proved in Committee a week or so ago.

In the course of his remarks when opening the Bill on May 21, Mr. W. E. Tyldesley Jones, K.C. (for the Company), said that, but for the competition of electricity, probably very few of the great advantages offered by gas to-day would have been brought about. All that the Company asked was that there should be freedom of competition, by giving tenants freedom of choice; if the Gas Industry went down under that freedom it would be because electricity was the better medium.

(The Bill is a sequel to the Gas Light and Coke Company's Act of 1933 and the Gas Undertakings Act of 1934, which provide that housing authorities shall not impose conditions upon their tenants as to the media of light, heat, power, and energy they should use. One or two local authorities, however, have refused the Company permission to carcass the houses during construction, and the Company claim that in consequence the tenants of such houses have not the freedom of choice which Parliament has decided they should have.)

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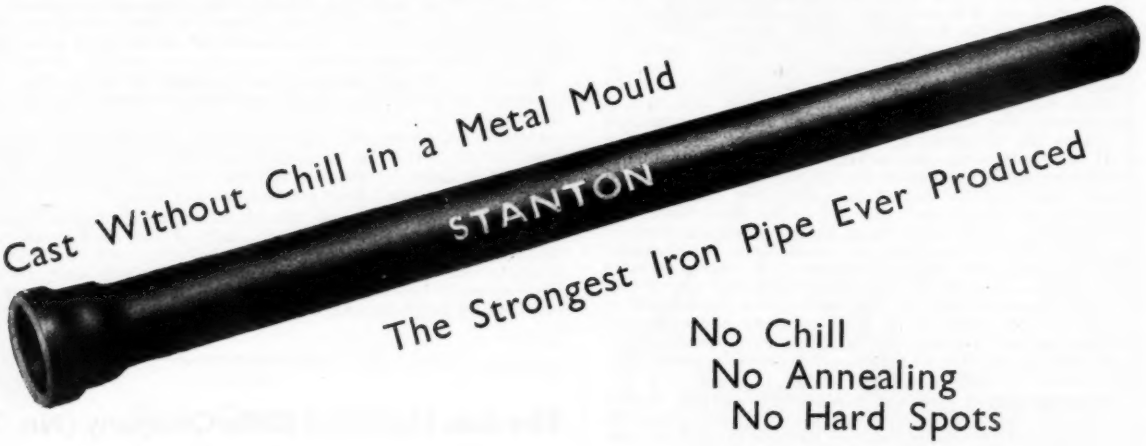
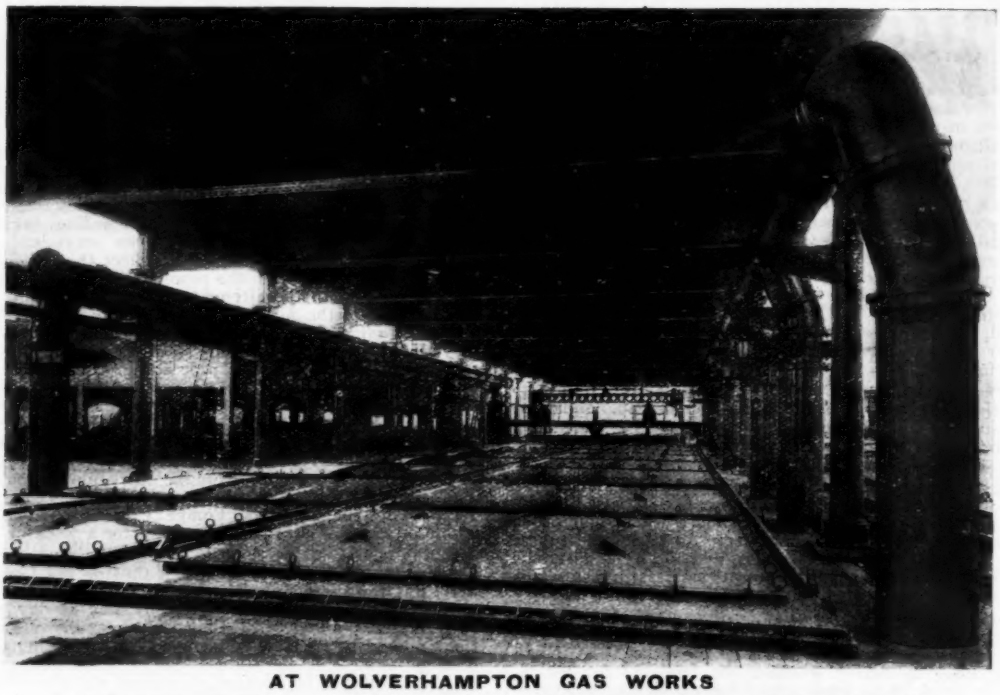
Manufactured under Delavaud and Mairy Patents



The Stanton Ironworks Company Limited, Near Nottingham



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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

There were very few bright spots in any sections of the Stock Exchange last week, business generally being quiet and the tone dull. Gilt-edged stocks closed fractionally lower, and with a falling-off in the demand home rails were similarly affected despite satisfactory traffic returns. Prices in the industrial market were weaker on the whole, though some signs of improvement were discernible towards the close, the main feature being a hardening of iron, coal, and steel shares. Oils supplied the most excitement, the Shell and Royal Dutch dividends providing an impetus though profit-taking in the twin Eagles led to a reaction in both these shares.

The Gas Market was again somewhat better supported than some sections, and, with the exception of a few *ex* div. reductions, price changes were all in an upward direction. On the London Exchange Mid-Southern Utility 3½% bonds hardened 3 to 100½ and Watford 3½% debenture gained a similar amount to 101½. In the Supplementary List, Associated Undertakings ordinary shares improved 1s. to 23s., while Oxford ordinary stock was marked up 5 points to 215, business being done at 217 at which price the yield is a satisfactory one at £4 12s. 2d.%. With the exception of a 3d. increase in Newcastle units to 26s. 3d. prices at the Provincial Exchanges continued unchanged.

The accounts of the Associated Gas and Water Undertakings for the year ended March 31 show a net profit of £14,139 (against £4,344 for the period Dec. 4, 1933, to March 31, 1935). The Directors are recommending a final dividend on the ordinary shares of 2½%, making 5% for the year, the carry-forward being increased from £890 to £1,590. Investments in subsidiary undertakings are valued in the balance-sheet at £705,131. As mentioned above, the quotation of the ordinary shares increased last week to 23s., which at the time of writing includes the full final dividend, the yield at this price being £4 7s.%.

Current Sales of Gas Products

The London Market for Tar Products.

May 25.

There is little change to report in the prices of tar products, which are as follows:

Pitch, about 37s. 6d. per ton f.o.b.

Creosote, 5¼d. per gallon.

Refined tar, 3¾d. per gallon in bulk at makers' works.

Pure toluole, about 2s. 6d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 8d.; and 90/160 pyridine about 4s. 3d. to 4s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

May 25.

The average prices of gas-works products during the week were: Gas-works tar, 20s. 3d. to 25s. 3d. Pitch—East Coast, 35s. to 37s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 35s. to 37s. 6d.* Toluole, naked, North, 2s. 2d. to 2s. 4d. Coal-tar crude naphtha, in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5½d. Heavy naphtha, North, 1s. 1½d. to 1s. 2½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 4⅞d.; low gravity, 4⅝d. to 4⅞d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 2s. 4d. to 2s. 6d. Naphthalene, £22 to £24. Salts, 100s. to 105s., bags included. Anthracene "A" quality, 3d. to 3½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *May* 23.

Prices remain steady in this district and, owing to the want of supplies, business is rather quiet.

Crude gas-works tar.—The actual value is 34s. to 35s. per ton *ex* works in bulk.

Pitch is unchanged at 35s. to 37s. 6d. per ton f.o.b. Glasgow for export, and 35s. per ton *ex* works in bulk for home trade.

Refined tar.—Quotations are steady at 3¾d. to 4d. per gallon *ex* works in buyers' packages for home trade and 3d. to 3¼d. per gallon f.o.r. for export, with a fair volume of business taking place.

Creosote oil.—Demand is constant and prices are steady. B.E.S.A. Specification, 5¼d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; neutral oil, 5¼d. to 5½d. per gallon; all *ex* works in bulk.

Cresylic acid.—With practically nothing available for prompt delivery and, to a certain extent, for forward delivery, prices can only be taken as nominal as follows: Pale, 97/99%, 1s. 10d. to 2s. per gallon; dark, 97/99%, 1s. 8d. to 1s. 10d. per gallon; pale, 99/100%, 2s. 3d. to 2s. 6d. per gallon; all *ex* works naked.

Crude naphtha.—Supplies are still rather scarce with value steady at 5½d. to 5⅝d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 5½d. to 1s. 6½d. per gallon, and 90/190 heavy naphtha is 1s. 1d. to 1s. 2d. per gallon.

Motor benzole can only be secured in small quantities at 1s. 3½d. to 1s. 4d. per gallon.

Pyridine.—90/160 grade is 5s. to 5s. 6d. per gallon, and 90/140 grade is 5s. 6d. to 6s. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	8½	to	0	9	per gallon at works
Motor ,,	1	2	,,	1	2½	,, ,, ,,
90% ,,	1	3	,,	1	3½	,, ,, ,,
Pure ,,	1	7	,,	1	7½	,, ,, ,,

Contracts Advertised To-Day

Carburetted Water Gas Plant.

Bradford Gas Department. [p. 600.]

Coal.

Belfast Gas Department. [p. 599.]
Workington Gas Department. [p. 599.]

Fuel Handling Plant.

Glasgow Gas Department. [p. 600.]

Gasholders.

Bradford Gas Department. [p. 600.]
Newcastle-under-Lyme Gas Department [p. 600.]

General Stores (Tools, Tinware, Coal and Coke Bags, Lead, Lime, Oils, &c.).

Birmingham Corporation. [p. 599.]
Mansfield Gas Department. [p. 599.]

Lighting Goods (Mantles, Fittings, &c.).

Birkenhead Gas Department. [p. 600.]
Birmingham Corporation. [p. 599.]

Meters and Fittings.

Birkenhead Gas Department. [p. 600.]
Mansfield Gas Department. [p. 599.]
Stockton-on-Tees Gas Department. [p. 600.]

Oxygen, &c.

Birmingham Corporation. [p. 599.]

Painting.

Dewsbury Gas Department. [p. 599.]

Paints.

Birkenhead Gas Department. [p. 600.]

Pipes, Tubes, &c.

Birkenhead Gas Department. [p. 600.]
Birmingham Corporation. [p. 599.]
Bradford Gas Department. [p. 600.]
Stockton-on-Tees Gas Department. [p. 600.]

Purifiers.

Bradford Gas Department. [p. 600.]

Retorts.

Bexhill Gas Department. [p. 600.]
Bradford Gas Department. [p. 600.]

Trade Notes

A Correction.

We are asked by Messrs. Drakes, Ltd., of Halifax, to correct a slip which occurred in their advertisement on page 435 of last week's issue of the "JOURNAL." The charging platform illustrated should, of course, have been described as a recent job at Haywards Heath, and not *Heywoods* Heath as appeared at the side of the view.

Demonstration by the Foster Instrument Co., Ltd.

In conjunction with the Liverpool Gas Development Centre, the Foster Instrument Company, Ltd., of Letchworth, Herts., recently have arranged a demonstration of pyrometers and automatic temperature controllers suitable for gas-fired furnaces. The demonstrations will be held at the Liverpool Gas Company's Industrial Demonstration Room, Grenville Street South, from June 8 to 13 from 10 a.m. to 5 p.m. daily except on Saturday, June 13, when the hours will be 10 a.m. to mid-day.

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with the best advantages
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STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 22.	Rise or Fall on Week	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Mar. 16	7	7⅜	Alliance & Dublin Ord. ...	150—160	...	...
374,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	95—100	...	...
557,655	,,	Feb. 17	7	7	Barnet Ord. 7 p.c.	167—172	...	...
300,000	1	Mar. 30	1/4⅛	1/9⅜	Bombay, Ltd.	1¼—1½	...	...
179,305	Stk.	Mar. 2	9½	9½	Bournemouth sliding scale ...	218—228	...	223½—225
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	170—175	...	171—172½
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	148—153	...	150—150¾
50,000	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	108½
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
357,900	,,	Feb. 17	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6⅜	6⅜	Do. 5 p.c. Con. ...	155—160	...	...
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	144—149	...	...
855,000	,,	Mar. 2	7	8	British Ord.	158—163	...	...
100,000	,,	Dec. 16	7	7	Do. 7 p.c. Pref. ...	153—158	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—101	...	99
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	107—112	...	...
200,000	,,	,,	17/6§	3½	Do. 3½ p.c. Red. Deb. ...	98—100	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	32/-
150,000	Stk.	Jan. 6	4½	4½	Do. 4½ p.c. Deb. ...	81—86	...	...
626,860	,,	Feb. 3	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb.	110—115	...	...
98,936	1	Apl. 20	2/-	2/-	Colombo, Ltd., Ord.... ...	1⅜—1⅞*	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20/—22/-	...	...
609,204	1	Mar. 30	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	18/6—20/6	...	19/-
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref	22/6—24/6	...	...
1,775,005	Stk.	Feb. 3	5	5	Commercial Ord.	97—102	...	97
620,000	,,	Dec. 2	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
286,314	,,	Feb. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
807,560	,,	,,	7	7	Croydon sliding scale ...	158—163	...	161½—162½
644,590	,,	,,	5	5	Do. max. div.	114—119	...	118½—118⅞
620,385	,,	Dec. 16	5	5	Do. 5 p.c. Deb.... ...	121—126	...	...
239,000	,,	Feb. 3	5	5	East Hull Ord. 5 p.c....	107—110	...	108—109¼
184,555	,,	Feb. 17	6	6	East Surrey Ord. 5 p.c. ...	130—135	...	...
176,211	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	122—127	...	...
19,284,128	,,	Feb. 3	5⅔	5⅔	Gas Light & Coke 4 p.c. Ord.	27/9—28/9*a*	...	28/—28/6
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	90—93	...	91½—92
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—108	...	106½—108
8,602,497	,,	May 18	3	3	Do. 3 p.c. Con. Deb. ...	87—90*	−1	88—89
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—118*	−2	116½
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—116*	−1	114⅜—115½
270,466	,,	Feb. 17	6	6	Harrogate New Cons. ...	130—135	...	...
157,500	1	Mar. 16	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅞—1⅞	...	...
213,200	Stk.	Mar. 2	6	6	Hornsey Con. 3½ p.c. ...	135—140	...	137—139
5,600,000	,,	May 18	8	12	Imperial Continental Cap. ...	150—160*	−7	153—165½
223,130	,,	Jan. 20	3½	3½	Do. 3½ p.c. Red. Debs.	92—97	...	...
285,242	,,	Feb. 17	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180	...	...
165,736	,,	Mar. 16	8	10	Maidstone 5 p.c. Cap. ...	180—190	...	...
63,480	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	May 18	†10	†10	Malta & Mediterranean ...	195—205*	−5	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 17	5	5	M.S. Utility 'C' Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	104—104½
360,075	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	103—108	...	106½—107
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128	...	123
125,000	—	Jan. 2	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	99—102	+3	...
675,000	Stk.	Nov. 18	†3	†3	Montevideo, Ltd.	69—74	...	71—71½
225,000	,,	Feb. 17	7½	7½	North Middlesex 6 p.c. Con.	169—174	...	...
396,160	,,	Feb. 3	5	5	Northampton 5 p.c. max. ...	108—113	...	...
300,000	,,	Apl. 20	†9	†7	Oriental, Ltd....	165—170	...	167½
416,617	,,	Dec. 16	8	8	Plymouth & Stonehouse 5 p.c.	166—171	...	...
504,416	,,	Feb. 3	8½	8½	Portsmouth & Gosport Cons.	170—175	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	108—113	...	...
114,000	,,	Feb. 3	5	5	Preston 5 p.c. Pref.	110—115	...	...
355,698	1	Apl. 20	1/-	1/-	Severn Va'. Gas Cor. Ld. Ord.	20/6—22/6	...	21/6—22/3
454,510	1	Mar. 16	-/10⅛	-/10⅛	,, ,, 4½ p.c. Cum. Pref.	21/—23 -	...	21/6
133,201	Stk.	Feb. 17	8½	5	Shrewsbury 5 p.c. Ord. ...	147—152	...	...
90,000	10	27 May '35	‡3	‡3½	South African...	3½—4½	+¼	...
1,106,173	1	May 4	1/2⅝	1/2⅝	South East'n Gas Cn. Ld. Ord.	26/—28 -	...	27/—27/6
845,511	1	Mar. 16	-/10⅛	-/10⅛	Do. 4½ p.c. Red. Cum. Pref.	21/—23 -	...	22/-
200,000	1	,,	4	4	Do. 4 p.c. Cum. Pref. ...	20/9—21/9	...	...
450,000	Stk.	Feb. 17	4	4	Do. 4 p.c. Red. Deb. ...	101—104	...	...
6,709,895	,,	Feb. 3	5	6½	South Met. Ord.	124—127	...	124—126
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf....	145—150	...	148—149¾
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf....	104—107	...	104½
1,895,445	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	88—91	...	87½—88½
1,000,000	,,	Jan. 6	5	5	Do. 5 p.c. Red. Deb.	114—117	...	...
1,543,795	,,	Feb. 3	6	6	South Suburban Ord. 5 p.c....	131—136	...	133½—134½
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	122—127	...	126½
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	103—108	...	...
888,587	,,	Dec. 16	5	5	Do. 5 p.c. Deb....	123—128	...	125
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	104—109	...	...
427,859	1	May 4	9½	1/2⅛	S. Western Gas & Water Ord.	22/6—23/6	...	...
160,523	1	Apl. 20	...	-/10⅛	Do. 4½% Red. Cum. Pref.	21/9—22/9	...	...
110,000	Stk.	Dec. 16	4	4	Do. 4% Red. Deb. ...	100—105	...	...
647,740	,,	Feb. 3	5	5	Southampt'n Ord. 5 p.c. max.	113—118	...	...
121,275	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—103	...	...
350,000	,,	Feb. 3	5½	5½	Swansea 5½ p.c. Red. Pref. ...	111—116	...	...
106,000	,,	Dec. 16	6½	6½	Do. 6½ p.c. Red. Deb. ...	96—101	...	...
94,000	,,	...	...	...	Do. 3½ p.c. Red. Deb. ...	96—101	...	...
1,076,490	,,	Feb. 17	6½	6½	Tottenham and District Ord.	149—154	...	152½—153
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref....	130—135	...	130½
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	125
371,850	,,	Dec. 2	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
369,774	,,	Feb. 3	7	7	Uxbridge, &c., 5 p.c. ...	153—158	...	157½
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,340,521	,,	Feb. 3	7	7	Wandsworth Consolidated ...	158—163	...	161—162½
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	124½
1,317,964	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	123—128	...	125½
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	...
499,735	,,	Feb. 17	6½	7½	Watford and St. Albans Ord.	155—160	...	157—159
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	124½
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	133—138	...	...
200,000	,,	Dec. 2	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	,,	...	3½	Do. 3½ p.c. Red. Deb.	100—103	+3	...
158,400	,,	Mar. 2	5	66	Winchester W. & G. 5 p.c. Con.	115—120	...	...

a.—The quotation is per £1 of Stock. *b*.—Paid £3, including 10s. on account of back dividends. * Ex div.
† Paid free of income-tax. ‡ For year. § Actual for three months.

Stock and Share List continued overleaf.

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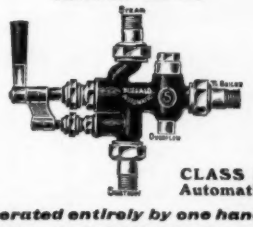

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STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. May 22.	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	Feb. 3	5	6	Bath Cons.	124—126	...	...
1,667,250	,,	Feb. 17	5	5	Bristol, 5 p.c. max.	120—122	...	...
120,420	,,	Dec. 16	4	4	Do. 1st 4 p.c. Deb. ...	103—105	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	103—105	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	125—128	...	...
274,000	,,	Feb. 17	5	5	Newport (Mon.) 5 p.c. max....	111—116	...	...
13,200	12	Mar. 16	7	8½	Pontyp'l Gas & W. 10 p.c. 'A.'	14—15	...	...
13,600	10	,,	5	6	Do. 7 p.c. B.'	11½—12	...	...
40,000	10	,,	5	6	Do. 7 p.c. 'C.'	11½—12	...	...
140,778	Stk.	Feb. 17	5	5	Weston-super-Mare Cons. ...	113—115	...	...
64,338	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—100	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	165—169	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb. 3	5	6½	Chester 5 p.c. Ord.	109—114	...	...
92,500	,,	Dec. 16	4	4	Do. 4 p.c. Pref.	100—105	...	...
32,540	,,	,,	3½	3½	Do. 3½ p.c. Deb. ...	91—96	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	100—105	...	...
2,167,410	,,	Feb. 17	6	6	Liverpool 5 p.c. Ord. ...	135—137	...	...
245,500	,,	Dec. 16	5	5	Do. 5 p.c. Red. Pref. ...	103—108	...	...
306,083	,,	Jan. 6	4	4	Do. 4 p.c. Deb. ...	105—107	...	...
106,280	,,	Feb. 3	10	10	Preston 'A' 10 p.c. ...	202—212	...	...
189,219	,,	,,	7	7	Do. 'B' 7 p.c.	140—150	...	...
NEWCASTLE EXCHANGE.								
122,877	Stk.	Mar. 2	8	8	Blyth 5 p.c. Ord.	154—156	...	...
732,000	,,	Feb. 3	5	5	Hartlepool G. & W. Co. & New	117—119	...	...
2,061,315	,,	Feb. 3	5	5½	Newcastle & Gateshead Con.	26/—26/6a	+-/3	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	107—108	+½	...
776,706	,,	Dec. 16	3½	3½	Do. 3½ p.c. Deb. ...	100½—101½	...	...
277,285	,,	May 4	5	5	Do. 5 p.c. Deb. '43...	103—104	...	...
209,820	,,	Mar. 2	8½	8½	South Shields Con.	169—171	...	...
299,542	,,	Feb. 3	6	6	Sunderland 6 p.c. max. ...	129—131	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Feb. 17	7	10	Derby Con.	176—186	...	...
55,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	175—185	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	130—140	...	...
20,000	10	Dec 16	5	5	Do. 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Feb. 17	10	10	Great Grimsby 'A' Ord. ...	220—230	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	220—230	...	...
79,008	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 17	6	6	Sheffield Cons.	147—150	...	...
95,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.... ...	100½—102½	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	...	...	...	Ascot Ord.	119—124	...	...
128,182	,,	...	...	...	Do. 5 p.c. Pref. ...	117—122	...	...
238,631	1	Nov. 4	5	5	Assd. Gas and Water Ord. ...	22/—24/-	+1/-	22/1—22/9
323,681	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	22/—23/-	...	22/3
150,000	Stk.	...	...	...	Do. 3½ p.c. Red. Deb. ...	...	...	...
17,000	,,	Feb. 17	8	8	Bognor Orig. Ord. 'A' ...	175—185	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	175—185	+1½	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	145—150	...	...
37,440	,,	Feb. 3	10	10	Cam. Univ. & Town 10 p.c. max.	210—220	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	158—163	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	108—113	...	...
65,000	,,	Mar. 2	7½	8½	Eastbourne 'A' 5 p.c. ...	160—165	...	...
198,000	,,	,,	6	7	Do. 'B' 3½ p.c.	133—138	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	120—125	...	...
130,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
250,000	1	Nov. 18	...	4	Gas Consolidation Ord. ...	20 6—22/6	...	...
250,000	1	May 18	4	4	Do. 4 p.c. Red. Cum. Pref.	19 6—20/6*	...	19/4½
700,000	Stk.	...	...	...	Gas Light & Coke 3½ p.c. Rd. Db	102—104	...	103—104
24,000	30	Feb. 3	8½	8½	Great Yarmouth 8½ p.c. max.	52—57	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.... ...	42—45	...	...
51,160	Stk.	Dec. 2	5½	5½	Do. 5½ p.c. Deb.... ...	123—128	...	...
152,600	,,	Mar. 2	8	8	Guildford Cons.	185—195	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	114—119	...	...
68,250	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
156,600	,,	Feb. 3	7½	7½	Hampton Court Cons. ...	167—177	...	...
81,660	10	Feb 4,'35	5	9	Leatherhead Ord.	16—17	...	176
107,960	10	Mar. 16	4	5½	Mid Kent Ord.	10—11	...	...
230,940	Stk.	Feb. 17	10	10	Oxford & District Ord. ...	210—220	+5	217
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	118—123	...	119½
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	113—118	...	...
126,193	,,	May 18	7½	7½	Peterborough Ord.	157—167*	−3	...
64,990	,,	Mar. 16	7½	7½	Redditch Ord.	113—118	...	...
166,850	,,	Feb. 17	7	9	Romford Ord.	170—180	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Mar. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
10,950	,,	Mar. 2	8	8	Ryde Ord.	165—170	...	...
136,191	,,	Feb. 3	5	7	Scarborough Ord.	128—138	...	...
27,825	,,	Feb. 3	8	8	Shanklin & Ventnor Cons. ...	152—162	...	...
40,643	,,	Mar. 2	7	7	Slough Ord.	147—152	...	...
221,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	116—121	...	...
28,872	1	May 4	5½	5½	S. Midland Gas Con. Ltd. Ord.	20/—22-*	...	...
28,866	1	Mar. 16	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/6—21/6	...	...
137,.3(		Feb. 17	7	7	Southgate & Dist. 7 p.c. max.	148—153	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
117,228	,,	Mar. 2	5	6	Swindon Cons.	111—116	...	...
60,425	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
50,000	1	Mar. 30	...	5·52d. a	Utd. Kingdom Gas Con. Ord.	20/6—22/6	...	21/4½—21/7½
760,910	1	,,	2½	2½	Do. 4½ p.c. Prefd. Ord....	20/—22/-	...	...
110,910	1	May 18	2¼	4½	Do. 4½ p.c. Cum. Pref. ...	21'—23/-*	...	21/1½—21/7½
900,000	Stk.	Mar. 16	...	3½	Do. 3½ p.c. Red. Deb. ...	98—101	...	...
130,000	,,	Feb. 3	5	8	Wakefield Ord.	140—145	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	105—110	...	...
500,000	,,	...	...	...	Wandsworth 4 p.c. Pref. ...	104½—106½	...	105½—105¾
82,000	,,	Feb. 3	6	6	Weymouth Ord.	106—111	...	...
98,384	,,	Feb: 3	6	6	Wolverhampton 6 p.c. Pref.	127—132	...	...
160,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Rd. Db	107—112	...	...
370,000	,,	Feb. 3	4	6	York Cons.	108—113	...	...
90,000	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...	...
133,640	,,	Feb. 3	6¼	6¼	Yorktown (Cam.) 5 p.c. Cons.	127—132	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
38,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Deb.... ...	130—135	...	...

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PART VI.

of

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R. N. LeFevre, M.Inst.Gas E.

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